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Railway Age

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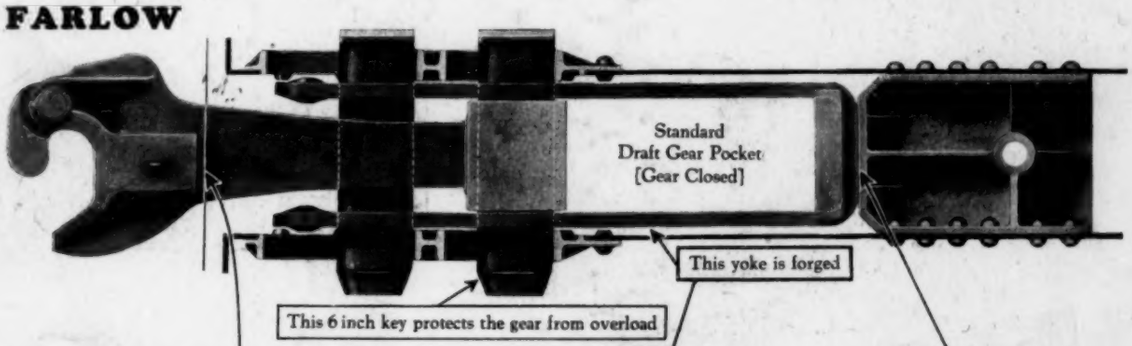
After the Draft Gear Goes Solid
Then What—?

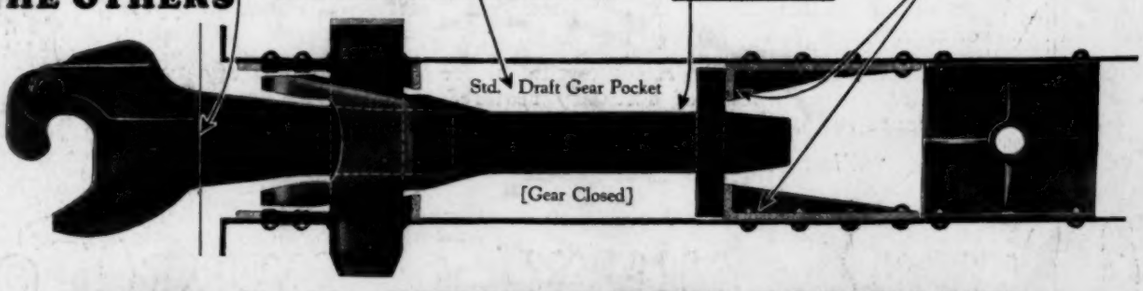
Distribution of buffing shocks in excess of draft gear capacity is an important factor for continuity of car service and low car maintenance.

Notice the construction of Farlow as compared with others. The draft gear has been closed under buff and this is when the damage begins.

FARLOW


Standard
Draft Gear Pocket
[Gear Closed]
This yoke is forged
This 6 inch key protects the gear from overload
The A.R.A. Standard requires ¼ inch coupler horn clearance when draft gear is closed. Without Farlow protection, some draft gears will crush until coupler horn strikes end sill casting.
The yoke works only under pull and a forging is more dependable than a casting in tension.
This draft gear stop according to U.S. Government tests, is twice as strong as these two together.

THE OTHERS



THE T. H. SYMINGTON COMPANY

Farlow Draft Gear Attachments Wrought Steel Side Frames Malleable Iron Journal Boxes

New York Chicago Baltimore Boston Montreal

WORKS: ROCHESTER, N. Y.

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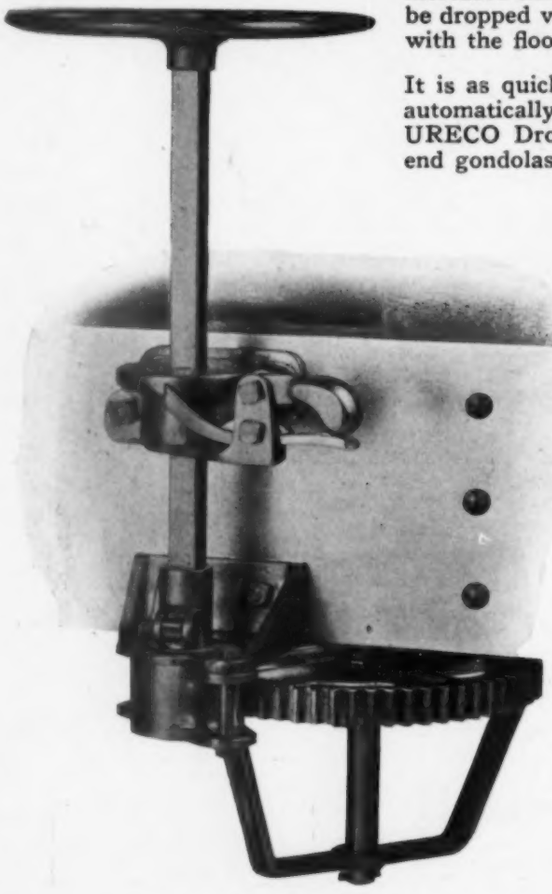
URECO

GEARED DROP BRAKE SHAFT

The URECO Hi-Power Drop Brake Shaft supplies greatly increased hand braking power and the shaft and brake wheel can be dropped vertically in an instant, bringing the wheel down flush with the floor.

It is as quickly raised to normal or operating position and locks automatically by means of the gravity trigger. One design of URECO Drop Brake is appropriate for all types of flat or drop end gondolas.



A quick take-up of the slack chain is provided on main gear. The URECO Hi-Power Hand Brake is also furnished with stationary shaft for all types of cars.

The URECO Hi-Power Hand Brake, either drop or stationary type, supplies the maximum of efficiency required under A.R.A. and Safety Appliance rules.

"What you don't have to spend for repairs is profit."

UNION RAILWAY EQUIPMENT CO.

McCormick Building, Chicago, Ill.

Montreal **Richmond, Va.**

EDITORIAL

Railway Age

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Cost of Labor Turnover

The past few years have brought about a more general appreciation of the necessity for stabilizing employment, not only in this country, but throughout the industrial world. The fear of losing one's job, or of being laid off because of a business depression, has seriously affected efficiency and economical production in the industrial and transportation fields. Then, too, there is a heavy expense due to rebuilding an organization after a partial or complete shut-down, even of short duration. A wise locomotive builder said many years ago that if locomotives could be standardized so that his company could go on making them when the railroads were out of the market due to falling off in business—thus maintaining a uniform rate of production—he could so far undersell his competitors as to drive them out of business. Concentrated industrial plants can calculate almost to a dollar what a shut-down due to an industrial depression costs them, and the figures are astounding. How about the railroads, particularly in the maintenance of equipment and way departments? Business falls off—maintenance expenses are cut—deferred maintenance piles up—business picks up—abnormal forces, out of line with the facilities, must be employed to take up deferred maintenance, etc., etc. How much money is wasted by this process? What could be saved if the departments were budgeted so that fairly uniform forces could be maintained at all times? Is it possible to calculate this saving so as to convince those in control of the finances of the folly of the practice outlined above? If so, how? Some suggestion looking toward this end will be found in the article "What Does It Cost to Build an Organization?" by J. C. Clark on another page of this issue.

Possibilities of the Radio

The chief executive of a railroad must impress his spirit upon the organization if he is to be a successful leader. The problem of making the necessary intimate personal contacts over a large area, however, is stupendous. This is particularly true of the Canadian National Railways, which extends across the continent, with a total mileage of almost 22,000 and about 100,000 employees. What a wonderful thing it would be if its leader, Sir Henry Thornton, could sit down and have a chat with each of these employees, and particularly if some of the stockholders (the stockholders on the C. N. R. are the taxpayers) could listen in at the same time. To a certain degree the radio is making this possible. That system has already installed one broadcasting station of its own—the most powerful in Canada—and has contracted for the use of other stations. To cover the entire system the building of additional broadcasting stations is contemplated. Sir Henry Thornton, or some of his associates and department heads, talk at regular intervals direct to the employees in their homes, telling them about the earnings, or the system's problems, or of its progress. It may be that too much fuel is being used or that the trains are being handled too roughly—a few suggestions to the men direct from the chief executive can do much to develop individual effort and teamwork and improve these or other shortcomings. Then, too, the individual employees, in whatever department, can be encouraged to solicit freight and passenger traffic or to cooperate in securing such business. To encourage the men and their families to listen in on these talks the company is supplying radio sets to its employees at cost and on partial payment plans. The employees are now buying these sets at the rate of about 20 a day. The broadcasting stations also send out news, market reports, music, etc., for the benefit of travelers on the transcontinental trains. That the general public is listening in on these programs—to both the employees and the travelers—is indicated by the letters that are being received from both Canada and the United States. The replies that are being sent to these letters should make many friends for the Canadian National Railways.

The Heart Not in It

The works had grown larger and larger and the problem of getting the best and most loyal service from the workers had become more and more difficult. There was a lack of that cordial and intelligent teamwork and cooperation which is so vital for the best interests of both the employees and the employer. Experts were called in—a survey was made—and after much research and study a plan was adopted which seemed to give great promise. Conditions improved for a time and then slumped back, although not to the low point at which they were when the new methods were first inaugurated. What was the trouble? No one was able to locate it, because the plan seemed to be letter perfect in dealing with the workers and in providing for their needs and convenience. Finally the plan was again critically reviewed as a whole—as if by an X-ray—and each part was checked up in detail. The parts were found to be perfect, but when they were all assembled and checked up one vital part—vital and yet not appearing on the surface, or easily located—was found to be missing. *The heart had been left out!*

Educating the Public

The Navy Department has just done a piece of educational work which is deserving of careful consideration by railroad officers. A large group of newspaper editors—more than 50—assembled at Charleston, S. C., and went on a navy transport to meet the battleship fleet at Virgin Islands. While on the transport these editors—from 32 states and from newspapers of all sorts and political beliefs—were given a course of study by means of talks and illustrated lectures by navy and marine officers. When they reached the fleet the party was divided into small groups and assigned to the different battleships. There they were initiated into all of the different phases of battleship operation. They were also given trips on destroyers, hydroplanes and submarines, being submerged in the latter. Three weeks of such instruction gave the newspaper representatives a fairly clear idea of some of the things the navy is doing and will thus enable them to

discuss navy affairs more intelligently and more fully. As a matter of fact, hundreds of pages of such material have already appeared. We are told that there was absolutely no attempt made to put over any propaganda and that the newspaper men paid all or the larger part of their expenses. What would it mean to the railroads if more newspaper editors were familiar with train and yard operation and if they were initiated into the mysteries of equipment maintenance by visits to the shops, enginehouses, car repair yards, etc.? It is important that the people of this country, through the newspapers, should know just how the various departments of the government are operated and administered. It is just as important in this period of intense railroad regulation that the people at large should have a real understanding of the problems which must be overcome by railroads in order to give the public satisfactory service. Cannot the railroads take a lesson from the Navy Department in this respect?

A Change for the Better

The annual convention of railway engineering officers held last week was characterized by a noticeable let-down in the restrictive policy pursued by several western roads in the last two years with regard to the attendance of their officers at conventions. Whether this condition resulted originally from the drastic retrenchment measures which characterized that period or from the notion that the time at these conventions was not well spent, the fact was that there was no incentive for these men to make an effort to participate in these meetings. In striking contrast to this is the statement made this year that on one of the roads, especially prominent in this connection, engineering officers not only received written inquiries as to their plans but in some cases were openly encouraged to attend. That this is a change in policy for the better is needless to say. The old theory that officers served their roads best by remaining constantly on the property has been proved a fallacy. The present era demands that engineering and other officers establish and maintain close personal contacts with developments and thought in other parts of the country. Conventions not only provide an opportunity for the exchange of ideas but also the inspiration necessary to sustained efficiency and progress. It is significant to note how large a proportion of the higher railway officers participate actively in convention work.

Who Should Provide Urban Improvements?

At a recent meeting of the board of trade of one of the small localities within the city of New York served by the line of the Long Island Railroad between Jamaica and Flatbush Avenue Station, Brooklyn, members expressed themselves as to methods for preventing the railroad from eliminating the grade crossing on the line by track elevation; the board wishes to force the railway to put its tracks in a subway and cover them, making a boulevard of the street now occupied by these tracks. The point at issue here is so fundamental and so general that it is time it should be recognized. At no place is the demand for railway improvements so constant and unrelenting as in terminal arrangements in large cities. City dwellers want all grade crossings eliminated, generally by the most expensive method—track depression; they want electrification; if there is suburban traffic, they want more trains and faster schedules. All these things, it must be admitted, are desirable from the public point of view. From the railroad viewpoint, on the other hand, such improvements are generally not nearly so desirable—indeed many of them would be a dead loss; and in these days of insufficient new capital it is folly to invest a single dollar where it will not bring in a direct and immediate return. As for suburban passenger traffic, it is so often unremunerative that in most cases to spend money on it would be to send good money after bad. In sum, the railroads stand to benefit but slightly or not at all from most of the urban improvements urged upon them. Who, then, does benefit from these improvements when they are made? Who else but the owners of real estate? A railroad depresses its tracks and electrifies and the values of surrounding property advance accordingly. More frequent and more rapid train service is provided to a suburban area; immediately more city dwellers are willing to become commuters and the price of real estate rises. Extraordinary improvements which bring no increase in net earnings to the railroads should be paid for in taxes or in some other way by those whose earnings they do increase. It will require time to educate the public to this point of view, but it is worth the effort. One necessary step, however, must be taken if any progress is to be made in gaining acceptance for it—the railroads must show their willingness to co-operate fully in planning and utilizing any facilities, which they cannot rightly be expected to provide, but which municipalities or property owners will build for them. For railroads to refuse to provide unremunerative improvements themselves and at the same time to offer no alternative method whereby they may be secured is only to postpone the solution of problems which become more complex as time goes on.

What Is Education?

Much of the disagreement which exists as to the value of education as opposed to practical experience as an aid to success in railroading comes from a lack of definite understanding as to what education really means. One man in speaking of it thinks of training in engineering. Another takes education to mean the study of improved methods for handling various kinds of railway work—including apprenticeship courses, air brake schools and such activities. Still another thinks of education as a mastery of the ordinary academic subjects—language, mathematics, history, economics and so on. Most of those who have argued pro and con about the value of college training for railroad service have based their arguments, not on college training in general, but upon some particular kind of college training—generally engineering. As a matter of fact, however, there are other kinds of college training to be considered, such as the straight academic variety and that provided in some of the university business schools which give courses not only in ordinary commercial subjects but in matters directly pertaining to railway work—such as railway operation, statistics, organization, finance, accounting and so on. It is not possible to state just what kind of education is the most valuable for railway work. All are important. It is probable, however, that education of the apprenticeship variety, i. e., training in some particular job, and the courses offered in technical and business schools in purely railway subjects are of the greatest immediate value. A general legal, engineering or academic training undoubtedly adds to the mental efficiency of an individual and thereby makes him of greater value to the railroad, but instruction in the solution of present railway problems and in the improved performance of particular railway jobs undoubtedly gives the quickest results. On another page of this issue Harry E. Thompson, a train dispatcher for the Chicago, Milwaukee & St. Paul, discusses the problem from this standpoint. He is of the opinion, which he expresses most persuasively, that the study of railway statistics—operating and financial—is a rich field for exploration by ambitious men in the ranks who have not had

the advantages of formal education; he points out that self-education in this field is easy by reason of the regular and detailed appearance of such data in the *Railway Age*. We believe that this article will be of interest to all our readers who are interested in improving their knowledge of railroading.

Railroads and the Merchant Marine Act

THE MERCHANT MARINE act of 1920—known also as the Jones bill—states it to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance of an adequate merchant marine under the American flag. In effect, the act was primarily intended to assist more adequate utilization of the vast merchant fleet which was built in connection with our country's activity in the world war.

The Merchant Marine Act applies to ocean traffic in much the same manner that the Transportation Act applies to rail traffic. That, however, is not all, because it also happens that the Merchant Marine Act contains various sections that have a great deal to say about railways.

Section 28 states, in general effect, that no common carrier shall charge rates between interior point and port on goods, exported or imported, lower than the domestic rates applying over the same route unless the goods so moving in foreign trade are to be exported or have been imported in a ship flying the American flag. This provision of the Merchant Marine Act has not yet been put in force. It has been suspended because in the same section power is given to the Interstate Commerce Commission to order such suspension on certification by the Shipping Board that there is not afforded at the ports adequate American shipping. The situation has now suddenly changed. The Shipping Board has now come to the view that adequate shipping flying the American flag is now available.

On February 27, the Board adopted a resolution certifying that "adequate shipping facilities are now available to handle the transportation of all commodities other than grain between the ports of the United States and ports of Great Britain and Northern Ireland and the Irish Free State, the ports of continental Europe north of and including Bordeaux and the east coast of Asia, the islands of the Pacific Ocean, Australia and the East India islands and the ports of Central and South America." Certification of this was made to the Interstate Commerce Commission on March 1. The commission's order requires the carriers to file tariffs which will put the provisions of Section 28 into effect on 15 days notice and as of May 20. Details of the action were published in last week's issue of the *Railway Age*, page 762.

How does Section 28 affect the carriers by rail? What particular worry have they in the situation? All the trouble results because, under circumstances as they at present exist, goods to be exported in American vessels will be entitled to export rates for their rail movement to the seaport, whereas goods to be exported in foreign bottoms must move at the domestic rates. This means that there will very likely be a marked disturbance in the routing of traffic due to the rate relationships. It seems likely that certain of the ports (and, therefore, the railways serving those ports) will suffer because business for export now moving through them will be directed at other ports. New York is one of the ports that will unquestionably gain considerably provided that it does not receive traffic beyond the point where increasing congestion will prevent economical handling in the port. Philadelphia and Baltimore may also be benefited and much business may be diverted through Canada. Ports that may suffer are Boston, the South Atlantic ports, the Gulf ports and the Pacific Coast ports. Because agents at local points may not know whether goods for export are to be moved in American or in foreign bottoms, great opportunity is offered for errors in waybilling. One can picture a marked increase in the number of accounting office employees handling correction notices and overcharge claims.

The following is a tabulation of the rates from Chicago taken as a typical interior point to New York and New Orleans respectively:

Class	1	2	3	4	5	6
Chicago to New York:						
Export or Domestic.....	142	124½	94½	66	56½	47½
Chicago to New Orleans:						
Export	135	119	90	63	54	45
Domestic	198	170	150½	127	103	85

It will be noticed that the domestic and export rates to New York are the same. At New York domestic shipments, however, are allowed 48 hours free time and export shipments 10 days. Except for this it will be immaterial in the rate whether the goods to be exported from New York are to move in an American or in a foreign vessel. How different, however, is the situation at New Orleans. The railroads serving New Orleans have met the rate to New York on export shipments. Formerly the export rates to New Orleans were the same as to New York. The fact that the New Orleans rate is now lower goes back to Exparte 74, the rate increase in 1920, when rates in the eastern district were increased 40 per cent and interterritorial rates 33 1/3 per cent. There are also certain commodity rates applying on export shipments through the port of New Orleans, whereas there are few such rates applying at New York which further permits New Orleans advantage in export trade. On the other hand the domestic rates to New Orleans are higher than the export rates and higher still than the rates either domestic or export to New York. It will be noticed that on the lower classes the New Orleans domestic rates are nearly double the export rates or the New York rates. What will that mean? It will mean that the shipper who desires to ship out of New York a commodity moving under 6th class rates will pay a rate of 47½ cents whether it moves in an American or in a foreign vessel. The influence to ship in American bottoms will be only such as he secures in the form of additional free time. How about New Orleans? If the goods shipped from Chicago via New Orleans move in an American ship the low rate applies—on 6th class 45 cents—but if it moves in a foreign ship the rate will be no less than 85 cents. The ocean rates from New York and from New Orleans to Central and South American points are usually the same, and to Europe, New York is slightly favored. Will not the tendency be, therefore, to ship via New York in preference to New Orleans?

Heavy machinery is a good example of an individual case. It moves in carloads at 5th class rates. In this case our shipper has a rush shipment he desires to send to Santa Marta, Colombia. The ocean rate from New York to Santa Marta is the same as from New Orleans. The shipper in this case has decided to ship via New Orleans. He chooses an American ship, the Merchmar, and his rate becomes 54 cents. Freight has a habit of missing ships now and then. Will he wait until the Merchmar returns from Colombia? No, he has a rush shipment. If his forwarders can book space on another American ship moving in a few days all well and good. Suppose, however, there is no American ship for a week or 10 days, but a Norwegian ship tomorrow. Will he choose the Norwegian ship and hold himself liable to the domestic rail rate of $1.03 or will he wait? Or will he learn his lesson and ship henceforth via New York or Philadelphia or Baltimore? Ships operating between New Orleans and Santa Marta, Colombia, sail under various flags, including, besides that of our own country, those of Britain, Norway, Panama, Colombia or Cuba. There are many that sail un-

der the flag of Honduras. Some of the individual lines have ships operating under no less than three flags. But why go further? Is not the situation offered to the Chicago shipper complex enough already?

There is, however, more to it than this. Look at the problem offered to the railroad in a case like this. How will the Illinois Central agent at Chicago know what rate to put on his waybill? He will have to know under what flag every ship going out sails. If it is an American flag, the export rate may apply, if not, the domestic rate. And if the shipment does not go on the boat intended, what then? Think of the auditing problem presented? One authority—not an Illinois Central man however—has estimated that the situation would give rise to enough overcharge claims and correction notices to require the auditor of freight accounts to add no less than 40 clerks, and accounting expenses on every road are certainly heavy enough now.

The situation at Boston is similar to that at New Orleans. Rates on goods moving to the port of Boston for export are the same as to New York but the domestic rate is higher besides which the carriers absorb on export business cartage charges from the freight houses to the piers. Boston does not use much lighterage service.

About the same relationship to New York applies at the other Gulf ports as at New Orleans and, in lesser degree, at the South Atlantic ports. The Pacific ports will be likely to suffer to some extent on business that may move either by the Pacific from Pacific coast ports or from New York via the Suez Canal, in which case the transcontinental roads will have another problem like that which has resulted from Panama Canal competition. The roads that move grain to South Atlantic or Gulf ports will not be offered any problem in connection with export grain. It is most significant that the Shipping Board has found that the supply of boats to carry grain is not yet adequate. It has probably also learned that the grain farmer is in no mood to permit any interference with the export rates on grain. It may be said that grain shipments moving in export trade lose their identity when they are put through the port elevators. So, however, do import shipments of coffee, sugar or wool.

In its annual report for 1921 the Interstate Commerce Commission devoted two pages to a discussion of Section 28. Among other things it said:

"When Section 28 becomes operative it is probable that export and import shipments moving in foreign vessels will seek the ports having the lowest domestic rates and at these ports foreign vessels will be able to compete upon practically equal terms with the United States vessels. The ultimate effect of Section 28 may be merely to divert traffic from certain ports to others with little or no gain in tonnage for United States vessels . . . In our judgment, the congress should take such action with respect to this section as may be necessary to obviate unnecessary conflict with the needs and usages of inland transportation."

American ships, for all there are so many of them, are at the present time carrying less than 24 per cent of our transoceanic exports and less than 17 per cent of our corresponding imports, and these proportions have progressively become smaller since the war. It is evident that much dislocation of present arrangements will result if Section 28 goes into effect. Such difficulties as will result will not properly be blamed on the Interstate Commerce Commission because apparently the law is mandatory and gives the commission no choice in its action. There may be ground for criticism of the Shipping Board but in the last analysis the fault, if there is any, must be laid at the door of Congress. There is a belief that the Shipping Board has acted at this time because Congress is in session and on proper overtures might be induced to amend the law. In that case, the board's judgment might be criticized, for Congress is in no mood to deal with such a matter as this at this time. Congress is in an inquisitorial mood. Legislation waits on presidential-year political maneuvering. Even the important tax revision bill and the appropriation measures cannot receive their proper attention.

In the last analysis, the interests of the railways and the merchant marine are one. We have here an unfortunate situation. Those in authority in the railway field should get together with those in the marine field and work this out. A means to do so has already been provided in the form of a committee appointed by President Coolidge to discuss the co-ordination of rail and water transportation. If the law is to stand, the efforts of both the rail and marine interests will have to be directed towards putting it into effect with least inconvenience to all concerned.

Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Communications, by W. Tetley Stephenson. A study of the chief existing means of transportation in the British Empire—shipping, railroads, highway transport, inland waterways, cables, and wireless, as connected with development of present markets and opening up of new ones. Vol. X of the series "The Resources of the Empire." Published by Ernest Benn, Ltd., London, England.

Driven From House and Home; Report with Illustrations of the French Methods of Expelling German Railway Employees from the Rhine and Ruhr Districts. 24 p. Published by Verlag für Politik und Wirtschaft, Berlin, Germany.

How to Save Fuel. Papers Contributed by Central of Georgia Railway Employees to International Railway Fuel Association Contest, 1923, Together With Winning Prize Paper [by W. L. Richards, Union Pacific Ry.] 244 p. Published by Central of Georgia Railway, Savannah, Ga.

The Northern Pacific Land Grant. Hearings [Parts 1-3]. Part 1 contains President Coolidge's letter, letters from Secretaries of Agriculture and of the Interior, with brief and statutes relating to grant. Parts 2 and 3 contain testimony on March 1, 5-7, 1924. 115,170. 48 p. Published by Govt. Print. Off., Washington.

The Packing Industry; A Series of Lectures Given under the Joint Auspices of the School of Commerce and Administration of the University of Chicago, and Institute of American Meat Packers. Especially "Live Stock," by H. C. Wallace, "The Packing Industry; Its History and General Economics," by L. H. D. Weld, and "Distribution of Meat Products," by F. E. White. 357 p. Published by University of Chicago Press, Chicago, Ill.

Traffic Census, 1922. Compiled by Ministry of Transport of Great Britain. Report with statistics of traffic on Class 1 British roads during August, 1922. 18 p., 6 fold. charts, 2 maps. Published by His Majesty's Stationery Office, London. 1 shilling.

Periodical Articles

Men in Wall Street's Eye. Introducing Mr. Harry E. Byram, by A. St. John. Barron's, March 17, 1924, p. 11,

100,000,000 *Railroad Horsepower. Transportation Plant Costs* $5,000,000 *a Day to Operate and Maintain. Super-Power Next Step.* Barron's, March 10, 1924, p. 6.

Projected Rail Consolidations May Strike at the Very Roots of Private Property Rights. The First of Two Eye-

Opening Articles, by H. Parker Willis. Magazine of Wall Street, March 15, 1924, p. 848-850.

Uncle Sam—Traffic Cop, by E. V. Wilcox. High lights in the history of railroad regulation, with suggestions for relief of overworked Interstate Commerce Commission. Country Gentleman, March 15, 1924, p. 15, 36-37.

New Books

Crystalizing Public Opinion, by Edward L. Bernays. 5½ in. by 8 in. 218 pages. Bound in cloth. Published by Boni & Liveright, New York. Price $2.50.

This book fills a definite need. Governments, industries, charitable organizations and all individuals or groups which depend upon public opinion for success in their work have in the past few years come more and more to the realization that their methods of securing public support in the past were haphazard and inefficient. The result has been a more intensive study of this phase of activity and the growth of the profession called by Mr. Bernays "public relations counsel."

Strictly speaking, public relations counsel is new only as a profession. The societies, corporations and organizations which have been most successful in their dealings with the public in the past were so in most cases because high in their councils were men who made it their business to guide policies and interpret them to the public in a manner to enlist public confidence and support. Most organizations, however, remained content with their old methods—giving some thought to public relations, it is true, but leaving decisions about this vitally important problem to persons not expert in it and who had other duties to perform; and, where a man was employed with the sole duty of caring for public relations he was, more often than not, simply a publicity man, whose function was to get things in the newspapers or keep them out. He had little authority and was generally not consulted about policies and plans.

Then came the war and changed everything. By some happy circumstance the government seemed to realize fully the advantage of regimenting all the people behind it in the conduct of the war and wisely delegated the task to men who knew something about the job. The result was that most groups or individuals who need public support in their activities were given an object lesson in the power of this support when properly aroused and, what was more important, were taught that such support generally can be aroused if it is intelligently sought by men who are skilled in the work.

Mr. Bernays, therefore, treats the work of a public relations counsel—a man who not only seeks to interpret his organization to the public in the most favorable light but who, moreover, is consulted in order that the organization may determine its whole policy with a full consideration of its effect on public opinion. He does not concern himself with the mere publicity man or press agent, whose function is the securing of what amounts to free advertising in the newspapers.

The book is divided into four parts, viz., scope and functions, the group and herd, the technique and method, and ethical relations. Mr. Bernays has indicated the scope and functions of a public relations counsel by many varied and pointed instances of the things he may be called upon to do, as for example:

> One client is advised to give up a Rolls-Royce car and to buy a Ford, because the public has definite concepts of what the ownership of each represents—another man may be given the contrary advice. One client is advised to withdraw the hat-check privilege, because it causes unfavorable public comment. Another is advised to change the facade of his building to conform to a certain public taste. . . . A client is advised to make his labor policy, the hygienic aspect of his factory, his own personality, a part of his sales campaign. Another is urged to found a scholarship in his subject at a leading university.

Mr. Bernays, after considering the scope of the work of the public relations counsel next considers the material with which he has to deal, *i.e.*, public opinion, what it consists of and what its characteristics are. Here he ventures into group psychology, somewhat briefly to be sure, but so interestingly and pointedly that few persons could read his discussion without experiencing the desire to study the subject more fully. After making the obvious observation that to understand public opinion one must go back to the individual who makes up the group, he says:

> The mental equipment of the average individual consists of a mass of judgments on most of the subjects which touch his daily physical or mental life. These judgments are the tools of his daily being and yet they are his judgments, not on a basis of research and logical deduction, but for the most part dogmatic expressions accepted on the authority of his parents, his teachers, his church, and of his social, his economic and other leaders.

This generalization is not made, Mr. Bernays explains, in a disparaging sense, since it would be obviously impossible for an individual to pass reasoned judgments on all the situations which come to his attention from day to day. Some individuals, of course, carry the act of substituting custom, leadership or prejudice for thought further than is necessary, but everybody must do so to some extent. So tenacious are habits of mind that most ordinarily rational human beings having a deep-seated prejudice on some subject will build up a frame-work of reason around it—thus safeguarding an opinion which, if arrived at after the process of reasoning instead of before it, would have been something entirely different. The public relations man must recognize this situation as it is—not as it might be—and must, consequently, in most cases make his appeal to something more than pure reason. Other outstanding characteristics of the crowd are discussed with relation to their bearing upon public relations work; then the writer takes up the subject of technique and method and, finally, ethical considerations.

In discussing this last subject the writer shows adequate appreciation of the seriousness of the problem involved. A lawyer may without hesitancy plead a case of doubtful merit, because even such a case is entitled to a hearing, and opposing it is other counsel; and there is a judge and jury to make the decision. On the other hand, because of his special knowledge and because of the lack of opposition, the public relations counsel may often be reasonably sure of success with a case before "the court of public opinion," which case no court of justice or right would decide in his favor. There is already a tendency to dub any public relations man a "propagandist," particularly if he presents an unacceptable point of view. The crowd is jealous of its opinions and looks with suspicion upon anyone whose business it is to change them. Naturally, therefore, the public relations man can ill afford to undertake a case which will not bear careful inspection from a standpoint of ethics or to look with favor upon others of his profession who take such cases. The work is in its infancy as a profession and, with its wide possibilities for good, it would be unfortunate if by taking advantage of opportunities for gain through unethical conduct all such activities should fall under public displeasure.

Mr. Bernays says in the preface to this book: "If I shall, by this survey of the field, stimulate a scientific attitude toward the study of public relations, I shall feel that this book has fulfilled my purpose in writing it." No one can read this book without feeling that he has, to a large degree, succeeded. On the railroads it can be read profitably not only by those who have direct charge of public and employee relations work, such as directors of public relations and personnel, editors of employees' magazines and so on, but also by executives and other officers and by employees whose work brings them in contact with the public.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

I. C. C. Accounts Defective for Real Analysis

BOSTON, MASS.

TO THE EDITOR:

I have read with interest the article entitled Analysis of Equipment Maintenance Expenses by J. L. White in your March 1 issue. One of the principal causes for the increase in the ratio of equipment repairs is a very material change in size and characteristics of modern locomotives. Any such analysis to be of real use must be predicated upon a division of maintenance of equipment costs not now obtainable from the Interstate Commerce Commission accounts and until such a division is made we are groping in the dark.

Cost of equipment repairs should be divided into major classes of power in order to ascertain their real value; then there must be a clearer division between shop repairs and enginehouse repairs, based upon a time factor indicating loss of service as between these classes. It is conceivable that one class of power might show a relatively low cost of shop repairs per engine- or ton-mile, but at the same time require constant minor running repairs that would add to maintenance cost and decrease daily mileage so as to unduly increase the maintenance cost and capital burden. Another class might have heavy shop costs and show much greater availability between shopping than the first.

After obtaining this information we must have accurate figures on real train costs of the various classes of power to balance against the maintenance costs. The relationship between the two is of prime importance. Any study which does not include both, and in addition the investment account and carry charges of both locomotives and facilities, will only tell a small part of the story.

L. G. COLEMAN,
Assistant General Manager, Boston & Maine.

Depreciation Circulars No. 226 and No. 15100

SALT LAKE CITY, UTAH.

TO THE EDITOR:

In my letters to the *Railway Age* of December 1, 1923, "Funding Depreciation Reserve," December 22, "Decretion," and January 26, "Decretion," I have shown that depreciation computed on a basis of a comparison with new on a composite property is different from depreciation computed similarly on one article; in that on the composite property it is divided into two parts, one part cost depreciation (that will be restored in maintaining the property), and one part decretion (that will not be restored in maintaining the property), the latter ultimately reaching 50 per cent of the depreciable investment; while on one article, all depreciation is cost depreciation. I have given a tie system as the clearest example of a composite property.

On November 6, 1915, the Bureau of Valuation issued Circular No. 226, Method of Computing Depreciation to be used in valuation which is still in effect. This circular prescribes that the total depreciation on all units as compared with like units new will be deducted from reproduction cost new in arriving at reproduction less depreciation. The latter is used in arriving at a rate base (according to late decisions). This means decretion, or that proportion of depreciation that will not be restored in maintaining the property, will be deducted from reproduction cost in arriving at a rate base.

On August 23, 1923, the commission, acting under the Transportation Act, issued Circular No. 15100 prescribing the proposed accounting instructions to regulate depreciation charges against earnings. On page 12 of this circular it quotes from a Supreme Court decision:

"The company is not bound to see its property gradually waste without making provisions out of earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that, at the end of any given term of years, the investment remains as it was at the beginning. It is not only the right of the company to make such a provision, but it is its duty to its bond and stockholders, and, in the case of a public-service corporation, at least, its plain duty to the public."

Again, on page 16 it states:

"For these reasons only, ties, rails, other track material, ballast and track-laying and surfacing are omitted from the classes of the fixed depreciable property of steam roads."

This latter quotation means, that the present method of accounting for retirements of property covered by the five primary roadway accounts, given in the quotation, will continue to be made as retirements occur, and it follows there can be no charges against earnings to meet decretion or that proportion of depreciation which is not restored in maintaining a composite property, which ultimately reaches 50 per cent of depreciable cost.

Except through earnings, carriers have no other source of reimbursements for depreciation.

Therefore, if Circular No. 226 is sustained, by the commission and the courts, for use in valuation, and Circular 15100 prescribing depreciation charges is put into effect, notwithstanding the foregoing quotation from the Supreme Court decision, any carrier that makes further investment in new railroad property, such as extensions, double tracking, etc., must do it with the knowledge that 50 per cent of its investment in the foregoing five roadway accounts (eliminating salvage) ultimately will be confiscated, or perhaps understanding the situation when the investment is made, it might be called donating capital to the public's use.

On all other primary accounts (excepting units coming under the minimum), Circular No. 15100 is consistent with Circular No. 226. That is to say, in computing depreciation, using same data in both instances, the amount taken away from investment for depreciation will equal the amount received from earnings for reimbursement, which would be in accordance with the foregoing quotation from the Supreme Court decision, but for reason stated above, this plan is not economical as to charges against earnings and therefore as to tariff rates.

MARCUS A. ROBY.

THE Middle Atlantic States Regional Advisory Board of Shippers and Railroad Men met at the Bellevue-Stratford Hotel, Philadelphia, on March 13, with an attendance of about 300. W. J. L. Banham, chairman, reviewed the present situation and outlined the problems to be discussed. S. M. Betts (A. R. A.) described the box car situation, which is in better shape than it was last year at this time. Reports were received from representatives of the automobile industry, the cement manufacturers and the petroleum industry. Fifty thousand freight cars were loaded with automobiles in February; and March will show a higher record. A special committee is making preparations for the fresh grape traffic of the coming season. The name of the organization was changed to the "Atlantic States Shippers' Advisory Board." The next meeting will be held in New York on May 8.

Work on Rigolets Bridge Is Progressing Rapidly

Unique Pier Construction Adopted by the Louisville & Nashville to Resist Effect of Gulf Storms

By W. H. Courtenay
Chief Engineer, Louisville & Nashville

As a part of a general betterment program designed to enable the Gulf Coast line of the Louisville & Nashville to carry the heavier equipment required by increasing traffic, a structure of more than ordinary interest is being constructed across Rigolets Pass, a body of water connecting Lake Pontchartrain and Lake Borgne. The pass is, in fact, the outlet of Lake Pontchartrain, Lake Borgne being an arm of the Gulf of Mexico, and subject to the rise and fall of the tides. The bridge is approximately 30 miles east of the New Orleans passenger station of the railroad. The importance of this work is evident from the fact that the cost of this one project will almost equal the original capitalization of the railroad when it was organized nearly three-quarters of a century ago.

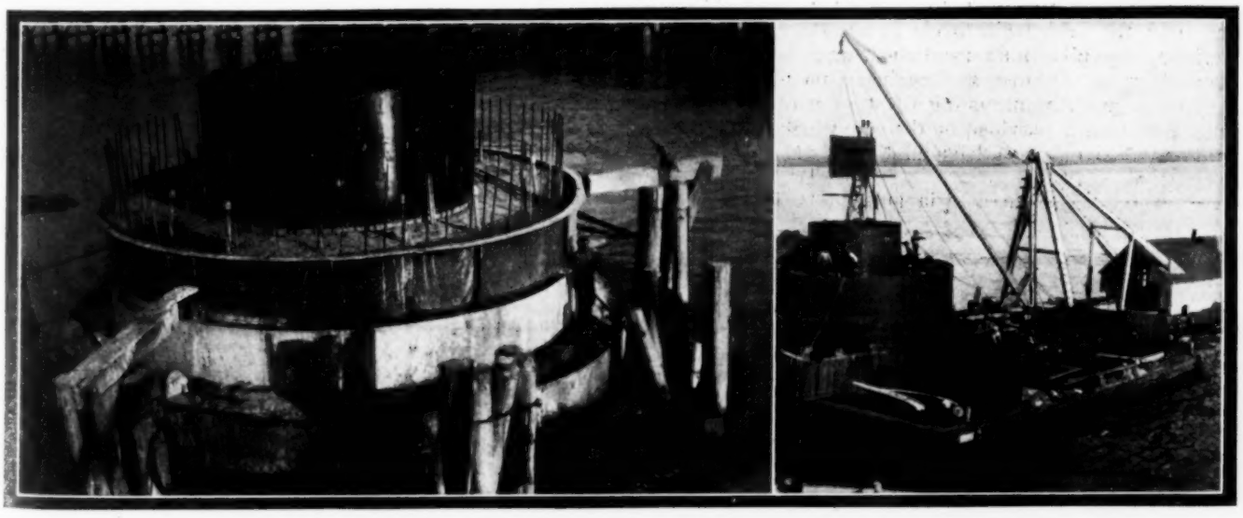
A View of Pier 1 with the Material Storage Dock in the Background

This project imposed the problem of carrying foundations to a great depth in order to reach a reasonably stable bearing. Coupled with this is the ever present danger of tropical storms that sweep the Gulf Coast from time to time with winds of enormous velocity. These difficulties have caused considerable trouble in the past. Storms have destroyed portions of the bridge at more or less frequent intervals. The present structure consists of girder spans on pile piers and a considerable length of creosoted pile trestle that replaced some of the girder spans which were destroyed in 1915 and which have not been restored because the present construction was pending. A through-truss swing span permits the passage of water traffic.

The New Bridge Is of Unusual Design

To meet the requirements imposed by these physical conditions the structure now being built is of unusual design. The main bridge is to consist of eight fixed truss spans 330 ft. long and a swing span of 414 ft. These will be supported on 10 cylindrical piers, 28 ft. in diameter, all of which are hollow except the pivot pier of the draw span which is solid. They are constructed of reinforced concrete placed inside of a steel shell that is partially assembled on a large barge built for the purpose before being launched and towed to the site. The outside wall of this shell has a diameter of 28 ft. for the upper 53 ft. 8 in. of the pier, and a diameter of 34 ft. for the lower; the inside wall forms a well 16 ft. in diameter.

These piers are being sunk to a great depth by open dredging through water, mud and sand to a footing on stiff clay. In addition to these piers there is one solid rectangular pier supported on piles and constructed in the ordinary manner by building a cofferdam which was unwatered by pumps during the placing of the concrete. Special attention has also been given to the problem of anchoring the through truss spans to the piers to avoid the danger of their being unseated by high wind velocities. The approaches are pile trestles.



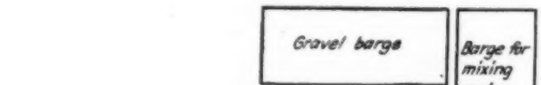
The Erection of the Steel Shell Comprised an Important Feature of the Work

The substructure work has been under way for some

time and it is expected that it will be completed in May. The contract for the steel superstructure has been let to the American Bridge Company.

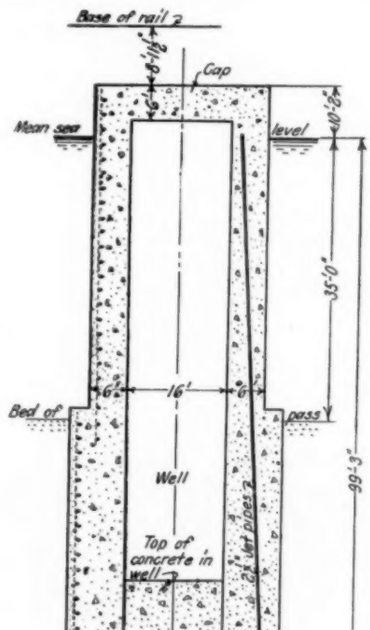
The two approaches are being filled from temporary trestles, but because of the extremely soft marshes it is expected that a large amount of material will have to be placed in the embankments over a period of several years before they can carry the tracks without the aid of the trestle, which has been built so as to be serviceable for traffic for this interval.

In order to interfere as little as possible with normal operation during construction, the new bridge is being built on an offset location from 100 to 200 ft. north of the old bridge. The absence of any solid ground within a reasonable distance from the bridge site made it necessary to place all material storage piles, the cement shed, work houses and living quarters for workmen and engineers on platforms supported on piles. An interesting illustration of the unstable ground condition is provided by the care which it was necessary to take to establish triangulation stations for use in locating the piers. Each of these stations consists of three piles carrying an instrument platform, while surrounding this group of piles, but entirely separate from it, is a second group of piles which carries a platform for the instrumentman. Board walks give access to the different stations.



The Concrete Plant as Arranged on Barges at the Site of Each Pier

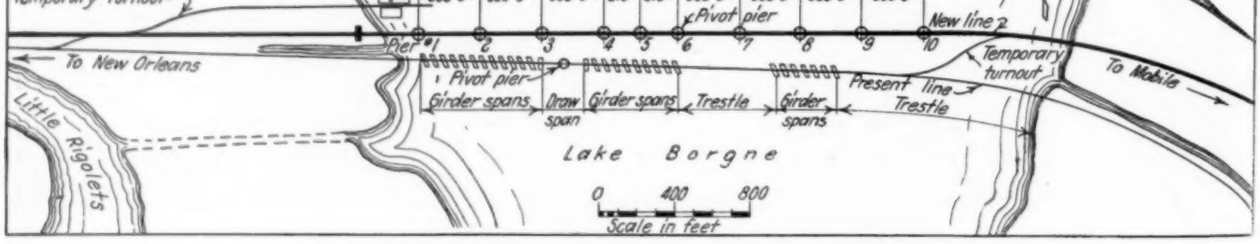
The cylindrical piers are being placed by the open caisson method the 16-ft. wells being provided so that dredging may be carried on. The lower 13 ft. 6 in. of each well is flared so that the inside wall of the shell joins the exterior wall at the cutting edge. This lower portion of the well and the entire exterior wall are made up of ½-in. plates, ¼-in. plates being used in the rest of the inside shell.



A Typical Vertical Section Through One of the Piers Showing the Reinforcement on the Left and the Jet Pipes on the Right

Steel Shells Floated Into Place

When the lower 27 ft. 10½ in. of the shell has been assembled it is floated to the site, which has been prepared in part by the driving of a number of guide piles. After the shell is in place it is enclosed by driving the remaining guide piles. As the pass is subject to considerable current, first in one direction then in the other with the rise and fall of the tide, a wall of sheet steel piling is driven around the caisson

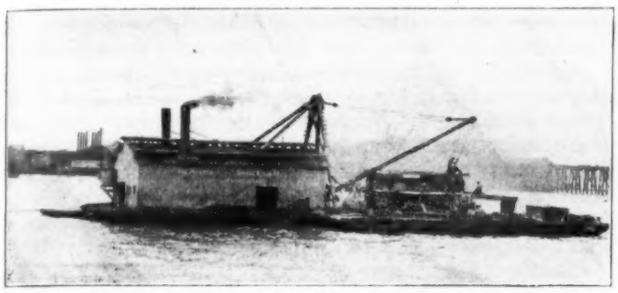


Relation of the New and Old Bridges Across Rigolets Pass

to provide further protection during the sinking process.

Additional seven-foot sections of the shell are added as the sinking of the pier progresses. As soon as sufficient bearing power has been attained to permit the placing of concrete above the water level the outside diameter of the pier is reduced to 28 ft., the exterior wall of the shell is discontinued and movable forms are used instead. The construction of the center well, however, is not changed, the permanent steel shell being used throughout.

The concrete aggregate comprises an excellent quality of well washed gravel, graded from ¼-in. to 2-in. and a clean,



The Construction Plant at One of the Piers

coarse sand graded 0 to ¼ in., obtained at Roseland, La. Both are largely of siliceous composition. They are unloaded from cars either directly on to a barge or on to a storage pile on a dock from which they are transferred to the barge as needed.

The mixer is mounted on a barge having overhead aggregate bins. These bins are fitted with measuring boxes so that the batch proportions may be accurately measured. The entire layout is arranged so that there is practically no handling of aggregate or concrete by hand. Cement is brought from the storage shed by a separate barge and lifted to the hopper by a conveyor.

Water is brought from the mouth of a nearby fresh water stream. A barge is towed into the fresh water where it is filled by opening valves in the bottom. The valves are then closed and the barge is towed back to the mixer barge. While the water in the pass is at times almost fresh there are occasions when it is salt and, owing to the ease with which fresh water is secured, there is little excuse for the use of water of doubtful quality.

Consistency and Time of Mixing Are Carefully Watched

A measuring tank on the mixer barge is filled with water under pressure. The amount of water it holds can be adjusted accurately and the pressure insures its rapid transfer to the mixer when the aggregates are being dumped into the drum.

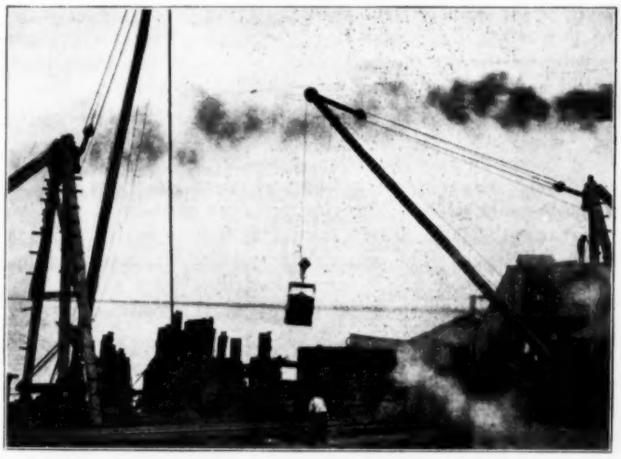
Both consistency and time of mixing are carefully controlled. The speed of the mixer drum is kept constant at 10 revolutions per minute and the materials are always kept in the drum for the full 10 revolutions. This thorough mixing facilitates handling the rather stiff concrete. Consistency is controlled to give slumps of 1½ to 2 in. in frequent slump tests. This consistency requires considerably drier concrete than is commonly used on work of this character, but no difficulty has been experienced in handling it and it is believed that the strength and resistance to weathering of the resulting concrete will be twice that which would be secured if the ordinary practice were followed. The proportions are 1:2:4 throughout.

A Smith tilting mixer is used, mixing approximately one cubic yard per batch. From the mixer the concrete is dumped into a bottom dump bucket set in a pocket provided for the purpose in the floor of the barge. A derrick picks the bucket up and deposits the concrete readily in any portion of the forms. To accomplish the same result with a chute would require a hoist which could not be handled any easier than the boom and bucket.

The concrete is well tamped, special attention being paid to tamping the portion adjacent to the forms. Judging from the surfaces exposed on the removal of the exterior forms from the upper portion of the piers the concrete is remarkably free from honey-comb pockets. As the shell is filled the bracing separating the outside and the inside walls is removed for use again on the next pier. The reinforcing steel near the outer wall is located accurately and tied in place before concrete is deposited around it. This reinforcement is provided for the purpose of giving the piers adequate bending strength to resist any lateral forces which may be imposed upon them during violent hurricanes. The steel plates of the shells between which the concrete is deposited are not relied upon for this purpose, for it is possible that they may rust away ultimately and reliance is placed solely upon the concrete for the permanence of the piers. The bars are placed not less than 15 in. from the outer face of the concrete.

Position of the Piers Controlled by Jetting

When the sinking has progressed to a point affording a degree of stability such that the mass will no longer sink of its own weight, the sinking is continued by dredging with a clam shell through the open center of the caisson and by jetting. For this purpose 16 jets are provided at equal intervals around the cutting edge. These are fed by separate pipes equipped with valves above the water level. Thus the jets can be used on one side of the pier only, or on all sides with equal intensity. Jetting, combined with dredging on



Placing Concrete Under Water in the Well with a Bottom Dump Bucket

the side showing the greatest resistance, has been entirely effective in holding the piers in a vertical position as the sinking proceeds. The material brought up by the dredge buckets is deposited some distance from the pier to avoid excessive pressure against the pier which might force it out of plumb. Provision has been made for capping the caissons at any stage so that the pneumatic process may be used if found necessary. However, there has been no need of this on the piers placed thus far.

The Sealing Is Carefully Done

When the sinking process is complete the bottom of the cylindrical well is sealed by depositing concrete in a bottom dump closed bucket to a height of about 15 ft. above the cutting edge. In order to insure uniform pressure over the

entire base (which is 34 ft. in diameter) it is important that the concrete previously placed in the annular shells of the piers be well keyed with the concrete deposited in the dredging wells. Therefore, after the first 15 ft. of concrete has been placed in the well, the water is bailed out and all laitance is carefully removed from the upper surface of the 15-ft. concrete seal. Three cuts are then made in each of three rings of the 7-ft. steel plates which line the wall of the dredging well. Each of the cuts is 4 ft. high and 15 ft. long. These portions of the steel plates are removed and recesses 6 to 8 in. in depth are cut into the annular portion of the piers. Concrete is then placed in the dredging well to a level above these recesses and is carefully rammed into them so as to form an adequate key between the concrete in the core and that in the annular portion of the pier. Thus the two portions must act together in resisting stresses. The difficulty encountered in cutting the recesses is excellent evidence of the quality of concrete secured. A total seal of about 35 ft. is placed in each of the cylindrical piers, except the pivot pier which will be filled to the top.

The top of each pier is capped with a six-foot layer of the same concrete as that used throughout. This cap, is, of course, reinforced and carries the bearing plates and anchor bolts to which the bridge spans will be secured.

High Grade Concrete Well Worth the Effort

The great care which is being exerted to secure high quality concrete deserves special mention. It has been found that clean, well graded materials are not difficult to secure, once producers are convinced that nothing else will be accepted. Very little if any extra labor has been required for the sloppy mixes often used. Certainly the cost has been insignificant when considered in connection with the better concrete that is being obtained. It is believed that better results have been secured in the concrete placed under water by the bottom-dump closed buckets than would have been secured by the use of the tremie. Moreover, the great depth would have made a tremie rather difficult to handle.

Progress Encouraging

Encouraging progress is being made. For example, on December 18, three of the cylindrical piers had been sunk to suitable foundation. The cutting edges of these three piers had stopped 91 ft., 99 ft., and 100 ft., respectively, below mean sea level. The rectangular pier at the west end has also been completed. It is expected that there will be considerable variation in the depth at which good footing will be found for the remaining piers.

G. G. Bryson, resident engineer, with a corps of seven engineering assistants and one accountant live in temporary quarters on the job. The writer is a frequent visitor at the work. G. R. Smiley, chief engineer of construction, Louisville, has general supervision of the construction. The designs for both the substructure and the superstructure were prepared under the supervision of the writer and J. M. Salmon, bridge engineer.

The contractor for the substructure, the Missouri Valley Bridge & Iron Company of Leavenworth, Kan., has taken the contract on a modified cost-plus-fee arrangement. D. W. Hedrick is the contractor's superintendent on the job.

A "Red Cap" Porter in the Broad Street Station of the Pennsylvania Railroad at Philadelphia was the chief figure in a lawsuit against the railroad company, tried recently, in which $670 was demanded for the loss of a suitcase which was entrusted to him by Mrs. Jessie S. Booker. The Municipal Court rejected the argument of the railroad company that the porter for the time being was the servant of Mrs. Booker and not of the railroad company, and decided the case in favor of the plaintiff; and the decision has been affirmed by the next higher court.

Freight Car Loading

Washington, D. C.

Revenue freight car loading during the week ended March 8 amounted to 929,505 cars, an increase of 24,161 cars as compared with the corresponding week of last year and an increase of 108,619 cars as compared with the corresponding week of 1922. This was a decrease of nearly 15,000 cars as compared with the week before but for some reason a slight drop is usually experienced about the first of March. As in several previous weeks the loading of coal, coke and ore was less than that for the corresponding week of last year but all other classes of commodities showed increases. The reduction in coal loading was 16,457 cars. On the other hand there was an increase of 21,435 cars of l. c. l. merchandise and an increase of 7,951 cars of miscellaneous freight while the loading of grain and grain products showed an increase of 5,013 cars. The loading of forest products, 82,888 cars, set a new record. The summary as compiled by the Car Service Division of the American Railway Association follows:

Revenue Freight Car Loading

Week ended Saturday, March 8, 1924

Districts:	1924	1923	1922
Eastern	227,985	220,041	207,656
Allegheny	194,460	193,109	173,438
Pocahontas	43,469	35,919	37,549
Southern	149,028	146,564	125,309
Northwestern	120,268	118,586	103,746
Central Western	132,970	136,289	119,928
Southwestern	61,325	54,836	53,266
Total Western Districts	314,563	309,711	276,934
Commodities:			
Grain and grain products	46,511	41,498	44,414
Live stock	31,165	30,797	29,555
Coal	169,807	186,264	203,815
Coke	14,300	15,240	8,521
Forest products	82,888	75,359	50,841
Ore	11,063	11,801	5,120
Mdse. L. C. L.	250,587	229,152	234,315
Miscellaneous	323,184	315,233	244,305
Total	929,505	905,344	820,886
March 1	945,049	918,624	793,115
February 23	845,898	830,187	728,925
February 16	935,109	816,646	773,275
February 9	906,489	849,352	777,791
Cumulative loading to date	8,854,122	8,559,532	7,427,006

The average freight car surplus for the United States for the period March 1 to 7 was 144,426 cars, including 53,578 box cars and 64,115 coal cars. There were also shortages amounting to 2,001 cars. For the Canadian roads the surplus was 10,075 cars, including 7,000 box cars and 1,200 coal cars, while the shortage averaged 500 cars.

Car Loadings in Canada

Revenue car loadings at stations in Canada in the week ended March 8 totaled 57,520, as against 57,059 for the previous week and 48,567 in the same week last year, or an increase of 8,953 of which 8,138 was in eastern Canada and 815 in the West. Since the first of the year 504,594 cars have been loaded as compared with 458,389 in the same period last year. Car loadings in Canada in the week ended March 8 as compared with the previous week are, by commodities, respectively:

Commodity	Week ended March 8	Week ended March 1
Grain and grain products	7,930	8,652
Live stock	2,278	2,562
Coal	5,426	5,404
Coke	270	275
Lumber	3,915	2,705
Pulpwood	5,012	4,525
Pulp and paper	2,433	2,272
Other forest products	3,998	3,852
Ore	921	1,002
Merchandise L. C. L.	13,975	13,373
Miscellaneous	11,362	12,437
Total cars loaded	57,520	57,059
Total cars received from connections	39,475	37,943
Total loaded for same week last year	48,567	44,208

Signal Men Study Cost of Stopping Trains

Automatic Train Control, Economics of Operation and Education of Employees Considered

AUTOMATIC TRAIN CONTROL and the problems connected with its study and installation, the economics of operation as affected by signal installations and the education of employees to make them more efficient in their work were among the more important subjects discussed at the sixth annual convention of the Signal section of the American Railway Association at the Drake Hotel, Chicago, on March 13 and 14. Such items as the proper length of block for train control installations and whether a train control system should be installed without the use of wayside signals were considered carefully. The costs of stopping a train was also reported on.

A total of 530 registered for the two-day convention, or approximately 29 per cent of the entire membership. B. T. Anderson (C. & O.), chairman, presided. H. S. Balliet (N. Y. C.) secretary, reported a total membership of 1,824 on March 15, 1924.

The record movement of heavy traffic made by the railroads during the past year, the noteworthy advances made in signaling and the utilization of signal systems to a greater extent than ever before were some of the high spots of Mr. Anderson's opening address. He also stated that more trains are being operated against traffic by signal indication, without train orders, than in the past and that the remote control of switches is accomplishing excellent results on many roads.

The Train Control Question

Mr. Anderson, in discussing the train control situation said that "probably the outstanding feature of the year has been the increase in train control installations and the increased interest in the train control question. Probably no phase of signaling has received so much study in the past year as that of train control. Since last March, committees of signal, operating, mechanical and engineering department officers of many railroads have been endeavoring to decide on the best type of automatic train control, to meet the particular needs of their railroads. On January 14, 1924, the Interstate Commerce Commission issued a second order requiring 45 additional railroads to install automatic train control over a complete passenger engine division by February 1, 1926.

"Two orders of such magnitude, affecting as they do so many railroads not equipped with signaling systems, has created an unusual interest in signaling subjects. The orders have raised questions of far-reaching effect to those in charge of the signal departments on the 94 railroads.

"The proper length of block must be determined, depending upon the braking curves for the grades, traffic and operating conditions on each railroad. In the past, blocks were from 4,000 to 10,000 ft. in length. Now, block lengths of 7,000 to 17,000 ft. in length are considered proper under certain conditions. It seems probable that on railroads of light traffic the block limits may be miles in length.

"Many railroad men are asking the question, 'Can train control in its present state of development be installed without the use of wayside signals?' One test installation without wayside signals has been placed in service. The majority of railroad men are applying train control on the basis that wayside signals are desirable.

"Perhaps these simple problems are too easy to solve as compared with that of choosing a proper type of train control. The ramp devices were first in the field. They have been in service on one steam railroad for over 10 years. In view of this record it is interesting to note that the majority of the 49 railroads have adopted the induction system of the intermittent or continuous type.

"At this time there are about 330 road miles of ramp type train control in service, about 110 miles of trial installations of the induction type in service and about 340 miles of permanent installations of the induction type under construction. The total mileage of all types is 780 road miles.

"After having adopted a system of train control, there remains the question of the power system. Should a direct or alternating current system be chosen? Fortunately the members of the Signal section through their committees are in a most favorable position to help in solving these questions, and no doubt during the coming year information on these and other phases of automatic train control will be made available."

Mr. Anderson called attention to the following important questions which the Signal section should act upon: (1) Assist in developing a unified train control system, a system which will perform satisfactorily on all railroads operating over joint territory. (2) Assist in developing a reliable train control system. The available records indicate that the failures of automatic train control systems greatly exceed those of automatic signals. This is, no doubt, due to the lack of development of train control as compared with that of automatic signals.

Continuing, Mr. Anderson said: "In 1910, it was stated that 'the automatic control of trains is still very much in its elemental stage.' Some railroad men still believe it is in its elemental stage."

Education of Employees

Consideration was given during the year by the Committee of Direction to re-establishing sectional committees. A careful analysis of all of the details developed into a study of the entire subject and interchange of considerable correspondence with individuals interested in it. A sub-committee of the Committee of Direction and a sub-committee of the Committee on Committees conducted these investigations. It was the conclusion of the Committee of Direction that sectional (regional) committees should not be re-established at the present time.

Committee V-Instructions, was instructed to investigate and report on what is being done in the way of education of foreman, other subordinate officers, and maintainers in the signal department by means of meetings or clubs.

The chairman was authorized by the Committee of Direction, at the solicitation of the Operating division, to appoint a committee of three men to represent the Signal section in joint conference with the Operating Rules Committee, to revise the block and interlocking rules.

The Cost of a Freight Train Hour

A report of especial interest to operating officers was presented by the Committee on Economics of Railway Signaling. This committee made a detailed study of train operation on a certain single track division and explained in a time study chart why the average speed of the freight trains was only 8.08 miles per hour. In another time distance chart, it was demonstrated that by the introduction of automatic signaling and remote control of switches, thus eliminating unnecessary stops and permitting the operation of trains by signal indication without written train orders, it is possible to

reduce the total freight train hours per 24-hr. period from 107 hr. 49 min. to 76. hr. 33 min.

This committee has also made a detailed study of the cost of a freight train hour as based on the statistics of the Interstate Commerce Commision and established a cost of $21.07 for a freight train hour. If, by the introduction of signaling, it is possible to eliminate 1.25 hr. of the delay, there will be a saving of 25 train hours a day for 10 trains each way a day. At $21.07 per hour this will amount to $192,264 a year. These reports were received as information.

Other Committee Reports

The Committee on Highway Crossing Protection submitted requisites for highway crossing signals of the flashing light type and the wig-wag type. It is specified that an automatic crossing signal shall operate a minimum of 20 sec. previous to the arrival of the train at the crossing as based on the speed of the fastest train operating over the section. The range of vision of the flashing light type of signal is set at a minimum of 300 ft. under adverse conditions. These specifications are now approved for submission to letter ballot for inclusion in the Manual and should exert a strong influence toward the standardization of the indications of highway crossings signals over the country.

The report of the Committee on A. C. Signaling, which contained detailed instructions on the application of rectifiers for signal system was accepted as information. That part of the report on d. c. signaling including instructions for making train shunt resistance tests and resistance tests on switch circuit controllers was withdrawn by the committee for further correction, while the specification for bonding was accepted for inclusion in the Manual. Five revised drawings and five new drawings were submitted by the Committee on Design. These drawings with a few corrections, were approved for submission to letter ballot and the special report on electric lamps for signals was accepted as information.

The elimination of derails in main tracks, as recommended by the Committee on Signaling Practice, was accepted for submission to letter ballot. With this material in the Manual, the railroads will have a definite basis on which to base their pleas to State Commissions for eliminating derails.

The report of the Committee on Instructions, including directions for the operation of storage batteries, instructions for making insulation tests and for handling of wire, was accepted for submission to letter ballot. Tables of units of values, and material percentages together with revisions the invitation to bidders, were included in the report of the Committee on Contracts and Valuation which was accepted as information.

Specifications for I. S. & F. locking for electro-mechanical interlocking was the principal part of the report of the Committee on Mechanical Interlocking which was accepted for submission to letter ballot. A specification for motor gasoline as based on that of the United States Government for gasoline as issued by the Committee on Lubricants and Liquid of the Bureau of Mines was presented to the Signal section by the Chemical Committee. With a few explanations the specification was accepted for submission to letter ballot for inclusion in the Manual. The Committee on Power Interlocking presented specifications for time locks and time releases which included such items as contacts, insulation, etc., the specifications being adopted for submission to letter ballot.

The Committee on Overhead and Underground Lines presented specifications for the construction of high and low tension lines both overhead and underground. The specifications were prepared originally by the Telegraph & Telephone section and have since been harmonized to meet the requirement of the several sections of the A. R. A. having to do with pole lines. The committee recommended that the specifications be accepted as information only.

H. G. Morgan, signal engineer of the Illinois Central, presented a paper on the application of alternating current supply with battery reserve for signal systems in which he explained in detail the advantages of the a. c. floating battery system in service on several installations of the I. C. He reported that the cost of an a. c. floating system for a three-track signal bridge location is $400 less than for the straight a. c. system while the cost of maintenance of the two systems is about equal.

Out of respect to the memory of W. W. Slater, the regular order of business at Thursday morning's session was stopped for a few minutes to pay tribute to his work in the signal field. T. S. Stevens (A. T. & S. F.), in paying tribute to Mr. Slater's work, pointed out that he was the dean of the signal engineers.

Election of Officers

The officers elected for the ensuing year were: Chairman, W. M. Vandersluis (I. C.); first vice-chairman, W. M. Post (Penna.); second vice-chairman, A. H. McKeen (U. P.). Members of the Committee of Direction were: Harry Hobson (A. T. & S. F.); D. W. Richards (N. & W.); E. P. Weatherby (T. & P.). Members of the Committee on Nominations were: C. H. Morrison (N. Y., N. H. & H.); C. J. Kelloway (A. C. L.); F. P. Patenall (B. & O.); B. H. Mann (M. P.); L. Brown (A. T. & S. F.)

The stated meeting for 1924 will be held on September 23, 24 and 25 at the New Ocean House at Swampscott, Mass. At this meeting it is planned to devote an entire day to the discussion of train control, when there probably will be some papers presented.

In Recognition of Courtesies Shown When the French Exposition Train Toured Canada in 1921, the French Government Has Presented These Medals to E. W. Beatty, President of the Canadian Pacific, and to C. E. E. Ussher, General Passenger Traffic Manager, and E. J. Herbert, Assistant General Passenger Agent

Railroad Traffic and the Business Cycle

Close Relationship of Freight Movement and General Business Facilitates Forecasting Railroad Trends

By Homer B. Vanderblue

Professor of Business Economics, Harvard University; Economist, Harvard University Committee on Economic Research

PART I. TON-MILE STATISTICS

THE VOLUME of railroad traffic, since it responds quickly to the alternation of depression and prosperity which constitutes the business cycle, is a sensitive index of the conditions of general business. In a period of expanding business, railroad traffic increases, frequently to an extent which tests the ability of the railroads to move the tonnage offered without delay and even congestion. Such a condition occurred in 1920. But during business depression railroad facilities are no longer utilized to their full capacity, since the demand for railroad service falls off with the decline in business activity. In 1921 and the early months of 1922 railroad yards were filled with idle cars, rusty and neglected; eighteen months earlier these cars had been part of a supply which was proving inadequate to meet the demands created by the post-war boom. During the later months of 1922 and well through 1923 an expanding volume of railroad traffic testified to the substantial recovery of business, while the cars which had been idle in 1921-22 were being repaired rapidly, and large additions to carrier equipment were made.

This close relationship of railroad traffic to general prosperity—which arises because of the character of the service that the railroad performs in our economic organization—means, furthermore, that few, if any, industries possess greater possibilities for utilizing the modern statistical and forecasting methods developed in the study of the business cycle.[1]

The present article seeks to demonstrate the purpose and use, rather than the technique, of these methods, and thus to suggest, in a broad way, their possibilities in the formulation of policies concerning the budget and operation problems which concern the railroad executive.

The Pre-War Period

Chart 1 presents the business curve (B) of the Harvard Economic Service, together with two series which reflect general conditions in the railroad industry. For the years prior to 1907 monthly figures for ton-miles of freight are not available; so, for 1903-1908, the net earnings of 10 leading railroads are used. Both series are plotted for the years 1907-08, and the substantial coincidence of the two railroad curves during those trying years indicates that the statistical series are equally satisfactory indexes of the volume of railroad business at that time. Were the curve for net earnings carried through 1914—the data are available and have been compared—a similar substantial coincidence would appear.

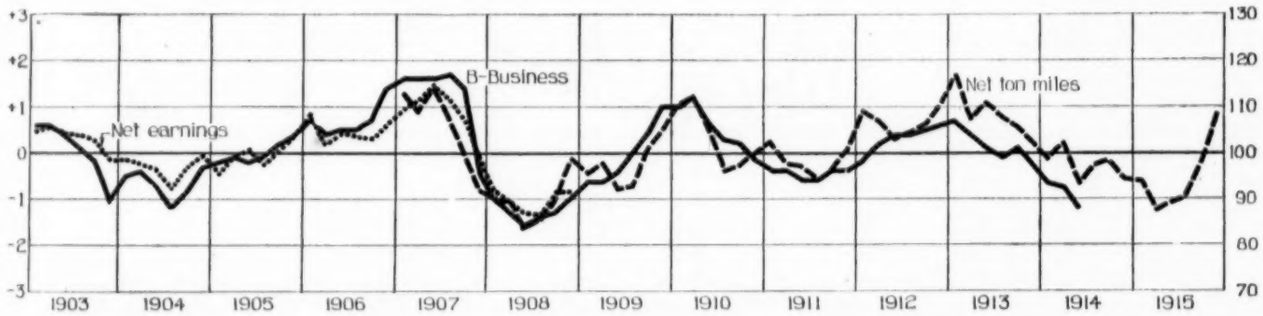


Chart 1. Adjusted Indexes of Net Earnings of Ten Leading Railroads (Class 1), Bimonthly, 1903-08, and Net Ton Miles of Revenue and Non-Revenue Freight, Bimonthly, 1907-15 (scale at right) Compared with the Harvard Economic Service Curve B (Business), Bimonthly, January, 1903-July, 1914 (scale at left). (Right-hand scale, percentages; left-hand scale, units of 1 standard deviation.)

Taken as a whole, Chart 1 shows clearly that railroad activity varies with general business conditions. Following the crisis of 1903, general business (curve B) moved into a depression which lasted until the fall of 1904; railroad net earnings likewise declined and began their subsequent upward movement with business. From 1904 to 1907 both curves advanced steadily—with a minor recession in the summer of 1906—until the latter half of 1907. Then the railroad curves moved down, even in advance of general business, so that, in 1908, all three curves were moving in a deep trough such as indicates general depression.

Business recovery began in 1908, and there was a sharp advance in the volume of railroad traffic, followed by a decline in 1909, while business (curve B) was continuing to climb to the peak of 1910. When the downturn of business came in the spring of that year, railroad traffic again dropped sharply, and, though it recovered slightly in the winter of 1910-11, relapsed again into depression in the following summer. No panic had occurred in 1910, and, since the depression of 1911 was not so severe as that of 1908, a confident upturn of business quickly developed in 1912. The peaks

[1] These methods were developed by Professor Warren M. Persons, of the Harvard University Committee on Economic Research, and are utilized by that Committee in its publications, the *Weekly Letters* of the Harvard Economic Service and the *Review of Economic Statistics*. In the early numbers of that *Review* Professor Persons explained his statistical work in detail, and this material is available in reprinted form: *Indices of General Business Conditions*, published by the Harvard Committee. I am indebted to the Committee for permission to reproduce the business curve (B) of its Index Chart, and directly to W. Floyd Maxwell, Assistant Statistician of the Committee, for assistance in analyzing the statistical material here presented.

of both the curves again coincided during this new cycle.

It is clear from Chart 1, moreover, that, when the European war began in the summer of 1914, American business was in a period of depression, although the decline from the peak of 1913 had been gradual. The effect of the outbreak of the war was to cause further depression in this country, until the stimulus of war orders was felt in 1915. From 1915 to 1919, emergency conditions arising out of the war rather than influences ascribable to the business cycle affected the volume of railroad traffic. The Harvard business curve is not available for those years.

Chart 1 also shows that the business cycle, instead of being a seven or ten-year phenomenon, as has sometimes been said, is actually of variable and relatively short duration; three to four years. Thus in the 10 years, 1904-14, there were three complete swings from depression through prosperity and into depression again; these were of varying intensity and the longest of the three cycles was that which culminated in 1907, when boom operations created a condition in business so unsound as to result in the panic of that year. The 10-year period thus included three crisis years, 1907, 1910 and 1913 (1903 had been the year of the so-called "rich man's panic"); and three years of depression, 1904, 1908 and 1911; between each year of depression and the next succeeding year of crisis came a period of expanding business activity reflected by upward movement of the business curve (B) and of the curve for railroad earnings or traffic.

Chart 1, therefore, supports the conclusion that business cycles are of comparatively short duration, and that there are recurrent periods of prosperity and depression which must be taken into account by the railroad executive who is seeking to appraise in advance the probable demands of the traffic.[2]

Correction for Trend and Seasonal Variation

All statistical series appearing on Chart 1 were corrected for seasonal variation and for secular (long-time) trend before that chart was constructed. This was necessary in order to show the business cycle in clear relief. The statistical methods by which these corrections were made will now be explained, utilizing the ton-mile figures for illustrative purposes. In 1907 these totaled 236.4 billion ton-miles (revenue and non-revenue); in 1915 the comparable total was 294.7 billion ton-miles, an increase of 58.3 billions. The monthly average of net ton-miles in 1915 was thus about 25 per cent larger than 1907—24.56 billions as compared with 19.70 billions.

The expansion of the railroad business may be shown by other figures: Between 1907 and 1915, some 25,000 to 30,000 miles of new single-track were built by the railroads of the United States, and over 9,000 new locomotives and 380,000 new freight and passenger cars were added to their equipment. These figures point to the conclusion that the period under discussion was one of rapid and sustained growth for the railroads of the country. This conclusion is also supported by Chart 2, on which are plotted the actual figures of net ton-miles of revenue and non-revenue freight during each month of these nine years.

The year-to-year growth is traced on Chart 2 by the line marked "long-time movement." This is the line of normal growth (the line of secular or long-time trend) of railroad traffic during the period.[3] In order to allow for this influence in calculating an index which measures the cyclical changes in the volume of traffic, it is necessary first of all to express each monthly item of the original series as a percentage of the corresponding "normal" item. The numerical value of the latter is indicated by the corresponding point on the straight line. Thus this measures the growth which would be attained during any month if there were no seasonal or cyclical influences operative. Chart 3 (the heavy curve) shows the ton-miles series corrected for long-time movement by expressing each item as a percentage of the trend—normal for each month. The trend line which inclined upward in Chart 2 is here shown as horizontal, and is represented as 100 per cent.

The next problem is the measurement and elimination of the usual seasonal variation. That there is a marked seasonal fluctuation present in the series is clear from a casual study of either Chart 2 or Chart 3. From January to February of each year the movement of the curve is usually downward, with a sharp upturn in March, followed by a less precipitate decline in April. Of course, this movement is to

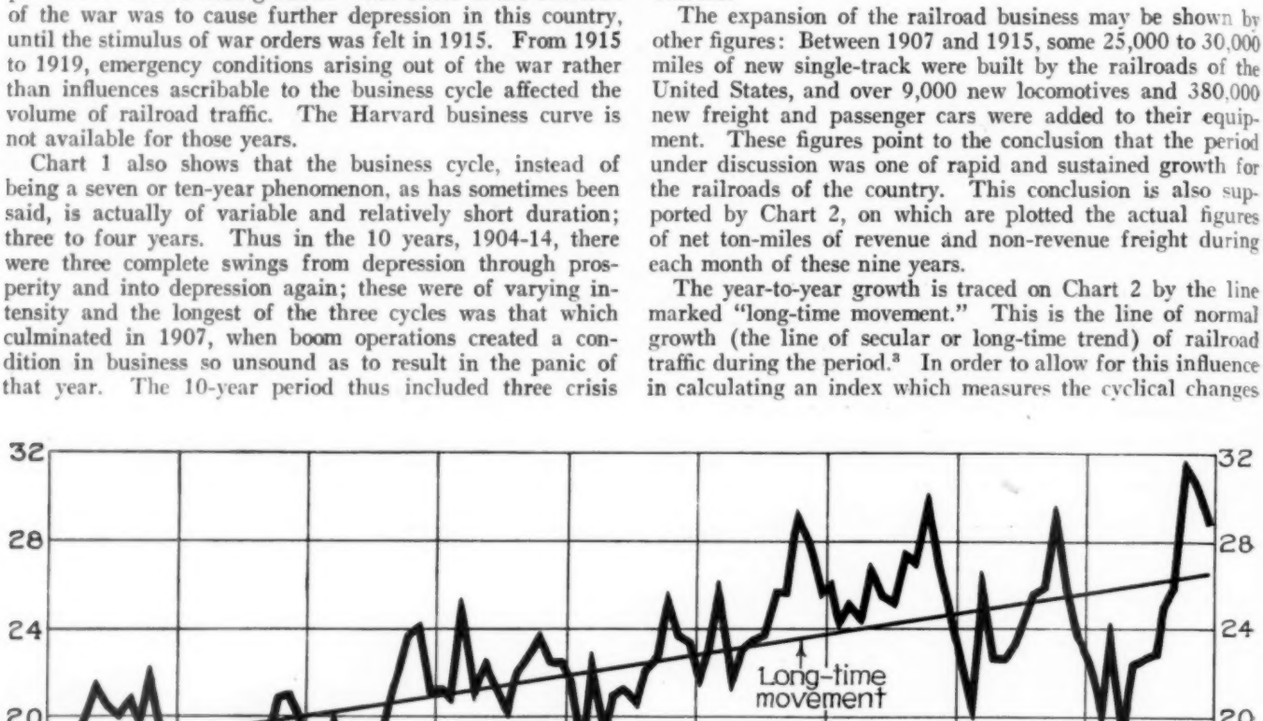


Chart 2. Net Ton-Miles of Revenue and Non-Revenue Freight: Actual Figures (Unit: 1,000,000,000 net ton-miles)

[2] The Index of General Business Activity compiled in the office of the chief statistician of the American Telephone & Telegraph Company is based upon monthly data back to 1876. This supports the conclusions stated above concerning the length of the business cycle. See table and chart in "The Statistical Control of Business Activities," by M. C. Rorty, *Harvard Business Review*, Vol. 1, pp. 158-9.

[3] The equation of the line of secular trend fitted by the method of least squares to the data for the period January, 1907, to December, 1915, is $y = 913{,}000{,}000\ x + 22{,}300{,}000{,}000$, where y is measured in net ton-miles and x in years from July 1, 1911. This linear trend shows a uniform annual increase of 913,000,000 net ton-miles. Thus the year-to-year growth amounted to approximately 913 million net ton-miles, or, on a monthly basis, an increase of some 76 million net ton-miles per month. The average of the monthly items is 22,300,000,000 net ton-miles.

be accounted for, at least partially, by the fact that February and April are relatively short months, while January and March are long months; nevertheless, the difference in length of month is not sufficient to account for all of the recurrent month-to-month change. Business normally slows down at the turn of the year.

From April to October, however, the volume of railroad traffic expands, and the month-to-month movement of the curve is steadily upward. In October of each year it reaches a sharp peak, generally occupying a position higher than that of any other month in the year, and, without exception, the general direction of the curve after October is sharply downward. Only in the crisis years, 1907 and 1910, was the October traffic peak below that of the first half of the year. This exceptional condition was clearly traceable to the unsatisfactory developments in business during the months immediately preceding.

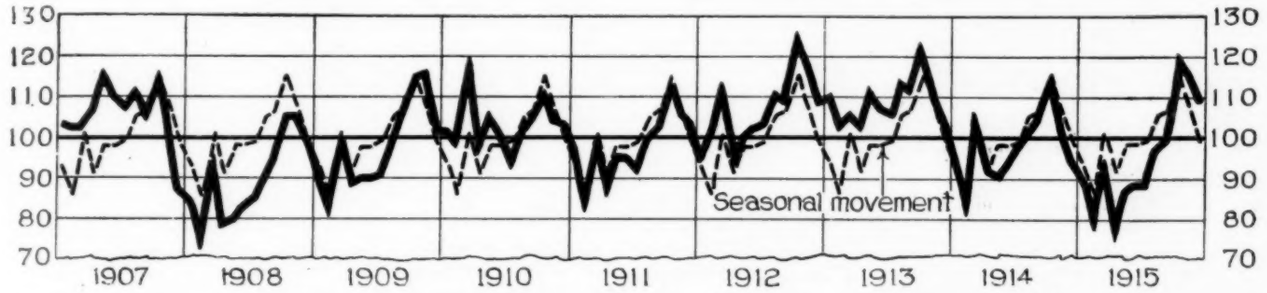


Chart 3. Net Ton-Miles of Revenue and Non-Revenue Freight: Figures Corrected for Long-Time Movement (Percentages)

The light broken line in Chart 3 traces the usual seasonal fluctuation in net ton-miles, the 100 line being taken as the monthly average for the year.[4] Adjustment for seasonal influence is made by subtracting the seasonal indexes, which trace the usual seasonal or month-to-month variation, from the indexes of ton-miles after correction for trend. These differences then register just how much the traffic in any given month exceeded or fell short of the normal for that month, the normal now including due allowance for both long-time growth and the usual seasonal change.

Chart 4 shows these differences expressed on a scale of 100 per cent instead of percentage differences (plus and minus), the 100 line representing the normal line above and below which the influence of the business cycle causes the volume of traffic to fluctuate. These items, since they are corrected for both long-time movement and seasonal influence, show the true cyclical fluctuations of the series. They are called "adjusted relatives." Chart 1 then compares the series of "adjusted relatives" for freight traffic (and, during the years 1903-1908, for net earnings of 10 railroads) with curve B (Business) of the pre-war Index Chart of the Harvard Economic Service.[5]

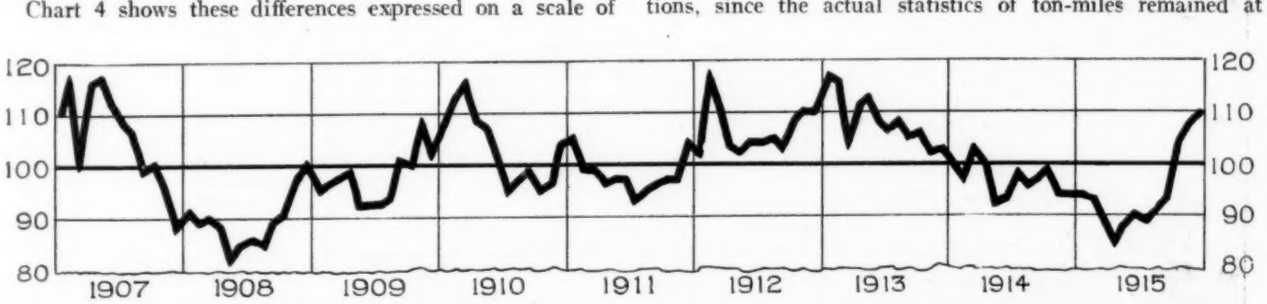


Chart 4. Net Ton-Miles of Revenue and Non-Revenue Freight: Figures Adjusted Both for Long-time Movement and Seasonal Variation (Percentages)

The Post-War Period

On Chart 5 are shown the curves for railroad traffic (adjusted relatives for revenue and non-revenue ton-miles) together with the business curve (B) for the post-war period. This chart, like Chart 1, shows the close dependence of railroad traffic upon conditions in general business. Both curves show the upswing during the boom of 1919-20, the sharp recession during the second half of 1920, the profound depression of 1921, and the recovery in 1922-3. The effect of the coal and steel strikes in October-November, 1919, that of the "outlaw" railroad strike in April, 1920, and finally the effect of the coal miners' and shopmen's strikes in the summer of 1922 are likewise shown by the sharp drop in railroad traffic while these abnormal conditions existed. During these periods emergency conditions dominated the cyclical influence which was controlling the volume of traffic.

During the summer of 1923 the index of railroad traffic declined from the high levels which it had attained during the spring, when curve B reached levels which caused many to fear that business was going at a pace too fast for safety. Business opinion became unsettled, and, although the volume of traffic continued on a high level during the summer, there was a substantial decline in the railroad index.

This decline in the indexes is due to the seasonal corrections, since the actual statistics of ton-miles remained at substantially the same levels during the months from March to November, inclusive. These were the months during which weekly total carloadings (to be discussed in Part II) so frequently exceeded the million mark. The fall peak appeared in October, but the increase was less than is usual at that season. In November and December, on the other

[4] The monthly seasonal indexes have been computed by Professor Persons' "link-relative" method described in detail on pages 18-31 of his *Indices of General Business Conditions*. The seasonal indexes are based on the period January, 1907, to December, 1921, inclusive.

[5] Since curve B (business) is a composite of several statistical series, it is expressed in units of "one standard deviation," or, as they are sometimes called, "cycle units." The use of this statistical device was also developed by Professor Persons, and is explained by him in his *Indices of General Business Conditions*. The series in curve B were corrected for trend and seasonal as explained in the above discussion concerning railroad traffic, and the cycle units for each series calculated by dividing percentage deviations (the amount by which the adjusted relatives exceed or fall below normal) by the standard deviation for the series. The "cycles" were then averaged.

hand, the decline was greater than that allowed for by the seasonal indexes and therefore the adjusted index continued to decline.

The foregoing discussion has indicated the close relationship of railroad traffic to the course of general business, as recorded by the business curve (B) of the Harvard Economic Service. In the years 1903-1914, and again in 1919-1923,

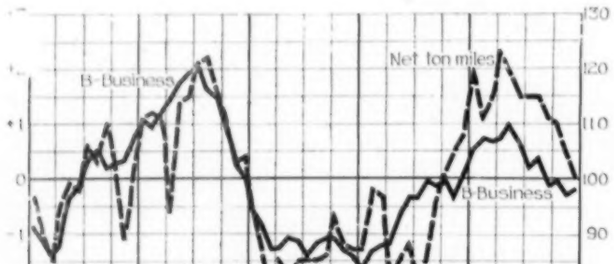
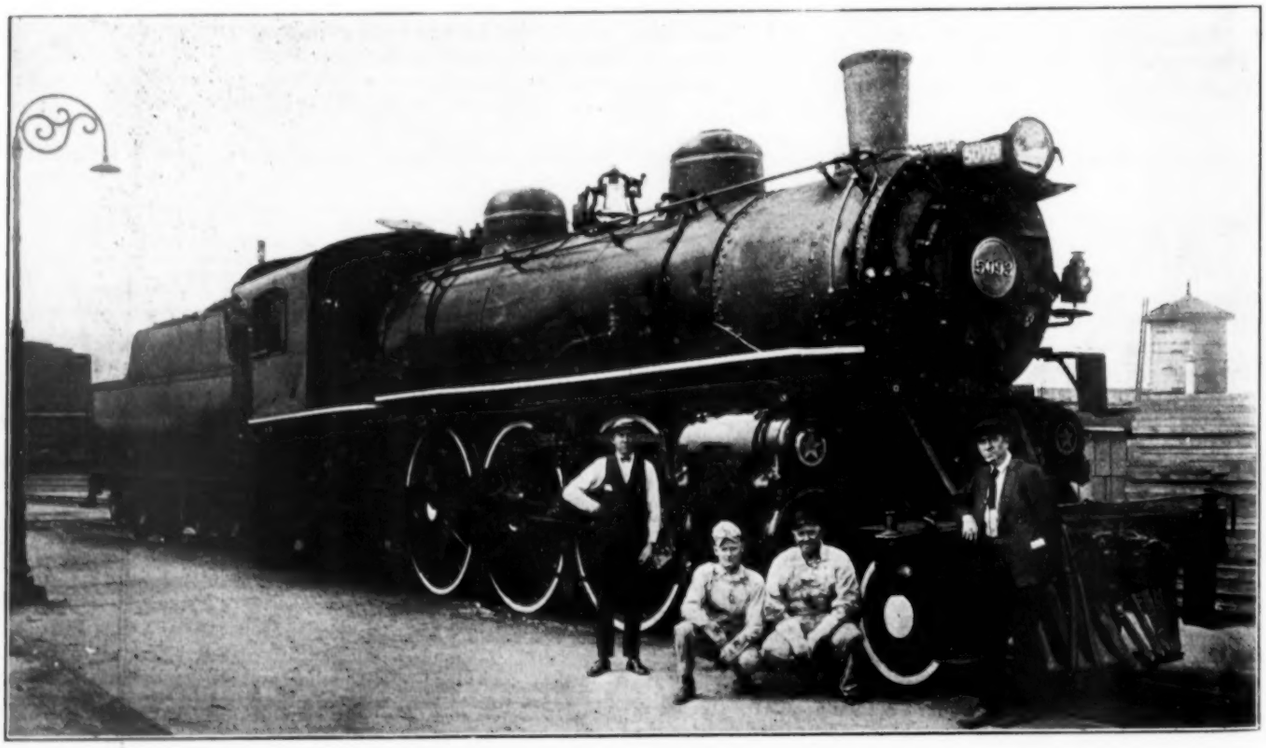


Chart 5. Adjusted Index of Net Ton-Miles of Revenue and Non-Revenue Freight (scale at right) Compared with the Harvard Economic Service Curve B (Business) (scale at left), Monthly, 1919-23. (Right-hand scale, percentages; left-hand scale, units of 1 standard deviation.)

a forecast of the probable course of curve B of the Harvard Index Chart would have served also as a forecast of the volume of railroad traffic. This study has served also to present, in non-technical form, the essential steps in the statistical analysis of a typical "time series" of railroad data. From the point of view of the individual railroad executive the series studied is important, since it records the influence of the business cycle upon the total volume of railroad service performed. But the particular series here considered in detail—total revenue and non-revenue ton-miles—presents a composite picture, while the railroad executive is concerned with conditions on a particular railroad system, where the statistical picture might well show considerable variance from the composite picture here presented. These differences would arise because of differences as regards growth, seasonal variation, and even the extent to which the volume of traffic is affected by general business. Though the timing of major turning points would tend to coincide for systems competing for the same general traffic, it is improbable that the amplitude of the cyclical swings would be exactly the same for any two carriers.

Hence an individual railroad executive, desiring to utilize this form of analysis in formulating a judgment on matters of operating or financial policy, will find it necessary to make a detailed analysis of the statistics showing conditions on his own road. This may be made by operating units or for the system as a whole, and it may consider classes of expense, or volume of a particular description of traffic, or any series for which monthly figures are available. Fortunately any well managed railroad already has most, if not all, of the needed data in monthly form, so that it can easily make demonstration of the detailed relationship of operating and traffic problems as affected by the business cycle. It is probable, furthermore, that, with these materials presented in the form shown on Chart 1, other statistical series would be found which move in advance of the particular series under scrutiny—or with it, or after it. It would then be possible to use the chart in forecasting the probable influence of the business cycle upon future revenues and requirements, utilizing methods analogous to those of the Harvard University Committee on Economic Research in forecasting business.



Courtesy B. & O. Magazine

A Resplendent B. & O. Locomotive

This Locomotive Runs Between Washington, Ind., and St. Louis to Trains Nos. 2 and 23. The Smoke Box and Stack and Pilot Braces are Bronzed. The B. & O. Safety Emblem is Painted on the Cylinders. Gold Stripes are Painted Around the Steam and Sand Domes. The white Striping is Kept Clean, and the Entire Locomotive is Always Highly Polished.

Education for Railway Service in Reach of All

Information Published Regularly in Railway Age the Basis —How to Correlate and Study It

By Harry E. Thompson

I AM UNABLE to accept the air of finality conveyed by the various articles that appear from time to time regarding the relative necessity or merits of college education as compared with the knowledge acquired from practical experience. "College training or you fail" on the one side, "Grow up in the business or you cannot master it" on the other, are cake-unturned theories.

A successful railroad man's education must have a foundation based on personality, into the formation of which enters both technical and practical knowledge and such qualities of the mind as diligence, persistence and the highest standard of honor. With such qualifications, a man is assured of success and it matters not whether Harvard or the switch shanty be his alma mater.

Criticism from the Bleachers

Can you not sit in the bleachers and spot the boners pulled by the big leaguers? Yet what a sorry spectacle you would make on the diamond. In the same way cannot the college bred officer, though he be not adept in extracting a brass or swinging a lamp, learn to detect the delinquencies of the practical man? It is a matter of judgment and no particular system has a corner on its development. You may as well argue that an officer from the ranks, from the train service for instance, cannot learn to supervise, as he must and does, the work of other branches of the service.

Today, acknowledged authorities agree that technical training is the proper starting point. However, such opportunities were not for all of us. About 50 per cent of all pupils that leave the eighth grade and 90 to 95 per cent of high school graduates are deprived of further schooling. If you are of this number, why despair? Others have succeeded regardless of this handicap. Education has been acquired outside of the school-room. Some of our most prominent and efficient executives are testimony.

How to Read the Railway Age

Granted that your opportunities for early education were overlooked, through your own fault or that of others, this is no cause for discouragement. You can start now. A mind in maturity is not as retentive as in youth, but that is more than offset by a stronger will, more determination. It has not been conclusively proved that the extensive reading courses, so frequently prescribed as essential to self-education, are as necessary as one may be led to believe. One thing, however, is necessary and that is a careful analysis of whatever one does read.

For instance, as you peruse the pages of this magazine, have available a blank sheet of paper and a dictionary and when an expression is noted that is not thoroughly understood, do not try to determine the meaning by the context, but stop right there. Look it up, write the word and its definition on the tab, then reread the sentence. At the completion of your reading period each day, look over the accumulation. It will surprise you to find the number of words of everyday use that you have heretofore been skimming over without fully appreciating their exact intent. Retain these vocabulary sheets and continue to review the words frequently until you have mastered their meaning and you are able to use them with aptitude in your conversation and writing. After a short period of this system of self-training, attempt for your own satisfaction to write a criticism of the articles you study. Write it carefully, then review it, eliminate superfluous words and repetitions, avoiding frequent use of the same word by substituting synonymous expressions. If you will but follow the reading system outlined for a short time, you will be so pleased with your improvement that thereafter the pad and dictionary will be a necessary part of your equipment.

Now for mathematics. Algebra, geometry, trigonometry and calculus have their place in the engineer's office. The digits with the proper application of the simpler elements of arithmetic, a knowledge of which you now possess, will get wonderful results. Try to analyze the operating and financial statistics given in the *Railway Age*. What a field! If you do not understand all the terms at first and you are unable to get the trainmaster to stand still long enough to help you out, your superintendent will not only assist you but encourage the trend of your endeavor.

Conductors and enginemen who think the chief is "hanging on too many cars" may, by a careful calculation of the expense per trip, be in a position to show him where he could save some money for the company by establishing a maximum train length. The following equation will give you the average cost of handling one ton one mile: Wages plus fuel cost divided by mileage multiplied by tonnage. While there are other elements of expense that are more or less influenced by the tons per train, this is sufficiently accurate to demonstrate the economical train load under ordi-

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THE WRITER IN SUBMITTING THIS ARTICLE WROTE AS FOLLOWS:

MILES CITY, Mont.

To the Editor:

The enclosure, while dealing in a way with the discussion on educational matters, is not intended to settle the controversial features, but rather to reach the vast majority of your non-subscribing readers, who have been led to believe that through lack of a few capital letters following their names, they are facing a gloomy future in this railroad world of ours.

If conditions at other points are similar to those within my observation, you are reaching thousands of railroad employees that as yet do not appear on your subscription list.

If, in your opinion, I can be the means of stimulating the ambition of such readers, I shall be very glad to see my article appear in the pages of the RAILWAY AGE.

H. E. Thompson,
Train Dispatcher, Chicago, Milwaukee & St. Paul.

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nary conditions. One trip compared with another in which there are tonnage variations will quickly develop the truth.

Train Dispatchers! What is the average cost of moving one empty or one load one mile on your division? What is the average earning power per freight car per day on your system? The *Railway Age* furnishes the monthly freight earnings, also the total number of freight cars on your railroad. Note how the earnings are affected by the average car miles per day, especially during the season of car shortage. Ask your superintendent for the auditor's blue print, issued monthly, showing the distribution of expense. Study it. Analyze each heading and note how the rise and fall of one affects the others.

The Kind of Education a Railroad Man Needs

Try and establish by tabulation over a number of months, the relationship between average tons per train, cost per gross ton mile, revenue per car per day, and note how each is influenced by the average car miles per day. Obtain annual statements of other railroads and study them. Learn the significance of the different items and their ultimate bearing on that railroad's standing on the stock market.

There is no limit. It is a lifetime study and a very interesting one. Just because something happened that prevented you from going to college or even through high school, do not feel that you are hopelessly lost, a drudge the remainder of your life. If you acquire ability it must be recognized. Granting that the college boys have had some of the cream, there is a reason. This is an age of figures. The old-time operating standards no longer exist. "Cost" is the slogan of every industry in the country—actual cost, not opinions or estimates. And a knowledge of cost means ability.

First, appreciate what you now possess—a practical insight into the cause and effect of conditions controlling costs.

Then, acknowledge to yourself wherein you are deficient.

Finally, bear in mind that you can secure, outside of the class-room, the elements that are necessary to make of yourself a successful railroad man.

Expediting Loaded Cars from Industries

THIS IS THE SUBJECT of a paper which was read before the Central Railway Club at Buffalo on March 13 by R. A. Munsch, car agent of the Lehigh Valley; or, to give Mr. Munsch's complete title, "What can agents and yardmasters do to expedite the movement of loaded cars originating at terminals or switched to hold tracks because of absence of proper data from agent?"

Mr. Munsch finds that delays are primarily due to the cumbersome system which retards the progress of the bill of lading to the way-bill clerk and the progress of the revenue way-bill, under varying conditions. The bill of lading is the important primary document. It must be dated as of the day upon which full shipping instructions have been received. The shipper makes this document and is responsible for its correctness in all details. It should be filled out immediately after the car is loaded and should reach the freight office before 5 p. m. Sending it by mail does not afford sufficiently prompt service; though where, because of movement over connecting lines, a car is certain not to begin its journey before the next day, the mail is sometimes satisfactory. The local agent should frequently check the records of the receipt of bills of lading to detect any delinquency; delays when discovered should be at once settled by telephone with the shipper; the agent should make a personal call if necessary. To industries located close to the forwarding agent's office, he will do well to have a regular messenger service, to gather bills of lading.

No loaded cars should be sent out of the yard except on the revenue waybill; this waybill should be prepared immediately upon receipt of shipping instructions and forwarded at once to the yard. Adherence to this rule avoids needless switching to put cars on the hold track. Where waybills cannot be ready on time, the telephone should be used to instruct the yard men how to chalk cars, to avoid delaying their movement to the proper outbound track. Extreme care in copying full details from the bill of lading will eliminate many causes of delay. Errors on waybills indicate inefficient service; corrections are costly and careful waybill clerks are of incalculable value. Messenger service between the agent's office and the yard office should be regular and the schedules strictly adhered to. Where cars are received from shippers through the switching service of another railroad, the interline switching waybill should always have the bill of lading attached to it. The switching road cannot perhaps be held legally responsible for bringing the bill of lading, but good service is promoted by conforming to such a rule. This would avoid many movements to the hold track. Interline waybills are often made carelessly; requiring the bill of lading at the same time helps to correct this evil.

Where industries work all night, the agent should arrange to have bills of lading collected at convenient times. Sometimes the gathering of the bills of lading, with proper service at yards, will start cars out five to twelve hours ahead of the time that they would go if work were done only in ordinary office hours.

At Buffalo the billing of many cars has to go through the Buffalo Transit Bureau. This bureau, acting for all the roads, and dealing especially with freight which is stopped in transit for the accommodation of the owner, has greatly reduced delays in movements of this class; but, the bureau is not open throughout the 24 hours and delays still occur to cars loaded late in the afternoon or in the night.

The hold-track clerk is responsible for promptly dealing with cars arriving from industries, or from connections, which have to be put on the hold track. He must make free use of the telephone to reduce to the lowest point all such delays. If he can learn the point of origin of a car, he must, when necessary, telephone to the agent there for a copy of the revenue waybill. Efficient work by this clerk will save much per diem. He should check his track every morning at 8 o'clock and then go immediately to the office and compare with bills in the racks; possibly the billing may have arrived after the cars were placed on the track. At 4 p. m. he should send to the superintendent, the agent, and the superintendent of transportation, a list of all cars held, giving all useful information. The yardmaster himself should see that cars without billing are the subject of immediate communication to all points necessary. Mr. Munsch would recommend the establishing of joint billing bureaus at large industries, and at groups of industries. Such a bureau should see that bills of lading always accompany cars transferred to another road within the switching district.

In considering the cost of delays, care should be taken not to confine the attention to conditions at the point of origin; the cost of delays entailed at other places may be a serious expense.

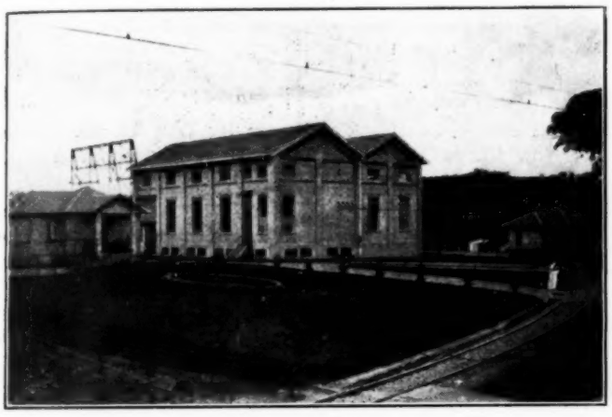
THE CANADIAN NATIONAL has equipped its International Limited, which runs between Chicago and Montreal, Que., with radio apparatus for the reception of programs from Canadian and American broadcasting stations. A receiving set and loud speaker are installed in the observation car. The loud speaker can be detached and head sets can be used by the passengers if desired.

Electric Operation of Paulista Railway in Brazil

Electrification Shows Large Savings on Road Which Must Use Wood or Imported Coal for Fuel

By Guy Bellows
Railway Engineering Department, General Electric Company

IN THE EARLY PART of 1920 the Paulista Railway, Brazil, decided to electrify that section of its lines between Jundiahy and Campinas, a distance of about 28 miles. The section of the line selected is double track and to a certain measure is the throat of the traffic from the interior of Brazil. While the Paulista Railway does not actually run into the city of Sao Paulo, the connecting link being the Sao



The Substation Located at Louviera

Paulo Railway (double track), this section of Paulista Railway handles all the traffic from its feeders and the Mogyana Railway from Campinas. The greatest point in favor of adopting electric traction was the high cost of fuel.

Both coal and wood are used. Coal is imported and wood is gradually growing more difficult to obtain with prices increasing in proportion. The economy therefore to be obtained from this source was well established.

Power for the electrification was contracted for with the Sao Paulo Light & Power Company. The material for the electrification was imported from the United States and consisted of 10 miles of 88,000 V. double transmission line, 4,500-kilowatt substation equipment, 27.3 route miles of double track 3,000-volt direct current trolley and distribution system and 16 locomotives. The total cost of the electrification, including all material, erection, construction, etc., was approximately $3,000,000.

The substation consisted of three units (motor generator sets) of 1,500 kw. each, making 4,500 kw. total continuous capacity, or 6,750 kw. for two hours. The locomotives consisted of 10 freight locomotives and six passenger type. Freight equipment was built for handling 772-ton (700 metric-ton) trains and passenger equipment for 441-ton trains.

Service Requirements

Electric service on the line was started in November, 1921, on the part of the line then completed and continued in steps until the completed zone was inaugurated in June, 1922.

A comparison of the traffic at the beginning of the electric service with the final service after electric traction had been finally put in full swing is interesting. All freight trains are scheduled and run regularly and the schedule is maintained to a surprising degree of accuracy. When the electric service was started the schedule provided for 16 passenger trains and 50 freight, the latter including two of mixed service. After the electric operation was fully installed, the schedule was maintained for 20 passenger trains and 28 freight trains. The last schedule is taken as of July, 1923. During this period passenger traffic had increased materially and also there was a gradual increase in freight traffic. The reduction in number of freight trains was the result of increased tonnage per train and the more uniform and regular movements of traffic.

Locomotive Performance

The locomotives furnished for the service were equipped with regenerative control and while the grades are not long, they reach maximums of 1.8 and 2 per cent and are of sufficient length to return power to the trolley in considerable quantity. Profile of the line is shown in the illustration.

A Train Load of Coffee and Cattle

Train power consumption readings taken at the locomotives show that the average returned to the trolley in passenger and freight service amounts to 13.2 per cent. This includes the total for all switching and handling of locomotives at terminals and engine houses. While these averages show the return at the locomotive it is interesting to note that less than 5 per cent of this energy is returned to the power company's lines, showing that the railway company is obtaining almost full benefit from the regeneration since the greater percent is used direct from the trolley. In addition to this economy there is also the saving on brake shoes and maintenance of braking apparatus which is perhaps the more important of the two. Table I shows the averages of a typical month's service and includes the power consumed at the locomotive in all switching and stand-by losses of the locomotives handling through services. Actual yard switching in Campinas and Jundiahy is still handled by steam locomotives, but equipment for this service has been ordered.

The power actually consumed as measured on the power company's incoming lines covering the same month as the locomotive values given in Table 1 was 796,600 kilowatt-hours.

Table 1 shows the power consumption and power regenerated at the locomotives for one month's service measured on passenger and freight equipment. All of the locomotives were equipped with standard railway type kilowatt-hour meters excepting two passenger and two freight and corrections have been made to include their consumption on the basis of their services averaged in proportion to the total averages of the other locomotive equipped with meters.

TABLE 1

Class of Service	KWH. Motoring	KWH. Regenerating	Per Cent Regenerating
Passenger	303,510	30,505	10.05
Freight	363,595	57,530	15.82
Total	667,105	88,035	....
Average per cent regeneration	.....	.....	13.20

It is worth while to call attention to the power rates as affecting the railway company. For the period from 6 a. m. to 9 p. m., power is paid for at a maximum rate. From 9 p. m. to 6 a. m. the rate is reduced approximately 14 per cent. On Sundays and holidays the maximum rate given above (6 a. m. to 9 p. m.) applies for the full day. Maximum and minimum power demands are specified as well as a load factor between 6 a. m. and 9 p. m.

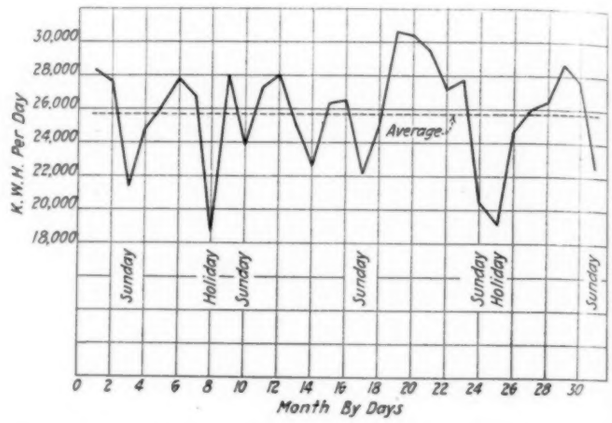
The above restrictions are in keeping with the customs and manner of handling traffic. On Sundays and holidays traffic is cut down so as to include only passenger trains, essential perishable goods trains and stock trains. On national holidays, special effort is made to keep freight trains to the absolute minimum.

A comparison of power measured at the locomotives to that actually measured on the power company's lines is of special interest, since it shows a ratio of 0.837. This ratio brings out the high economy possible with regeneration and also shows that the regenerated power is taken almost entirely from the trolley giving the railway company the greatest benefit and highest economy.

Costs

A typical monthly power consumption is shown on the accompanying curve. This curve shows the low power consumption on holidays and Sundays in keeping with the manner of handling traffic as mentioned above.

Special tests in freight and passenger service made by the engineers of the railway company, in conjunction with the manufacturer's representatives show remarkably efficient operation. Results of these tests in both passenger and freight service are given in Table 2. The figures given in each case are averages of a sufficient number of trains to eliminate errors and establish accurate data on the performance of their equipment.



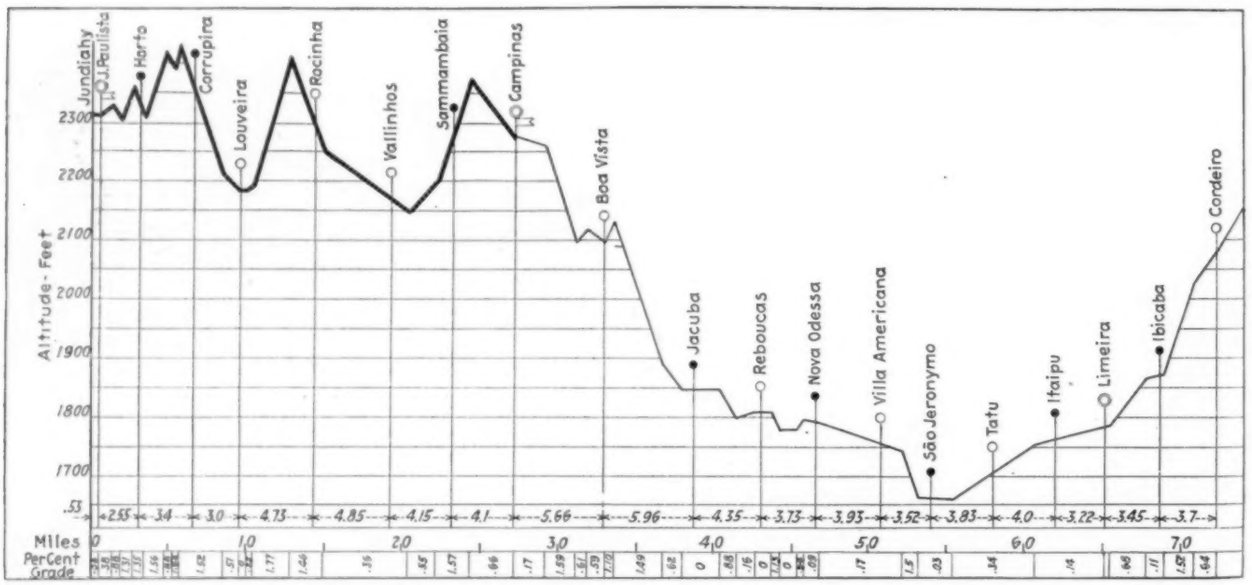
Typical Power Consumption Curve for One Month. Points on Curve Represent Total Daily Consumption

The railway company made a careful study of the service on the electrified zone as compared with steam operation, on the basis of one year's operation, equivalent to 465,750 miles. Table 3 shows the cost of operation for steam operation and Table 4 shows cost of electric.

From a comparison of Tables 3 and 4 it will be seen that the cost of the electric operation is approximately one-third that of steam and that the cost of power for the electric is approximately one-fourth that of the cost of coal.

Table 5 shows the comparison of heavy maintenance of steam and electric based on a year's service of train miles.

The cost of operating and maintaining the 10 miles of



Profile of the Section of the Paulista Railway Between Jundiahy and Cordeiro. Electric Section Is Shown by the Heavy Line

high voltage (88,000) transmission line and the 71.4 miles of secondary distribution system for one year of 465,750 train-miles is shown in Table 6.

TABLE 2—AVERAGES OF SPECIAL TESTS—FREIGHT AND PASSENGER SERVICE
CIA PAULISTA DE ESTRADAS DE FERRO

	Freight service	Passenger service
Distance of run, miles	27.4	27.4
Weight of locomotive, tons	99	120
Tonnage of trailing train	712	455
Tonnage of total train	812	575
Ton-miles trailing	19,500	12,470
Ton-miles total	22,250	15,750
Kwh. input at locomotives	571.8	509.0
Kwh. regenerated at locomotive	156.8	73.0
Kwh. net at locomotive	415.0	436.0
Per cent regeneration	27.38	14.3
Net watthours per trailing ton-mile	21.3	35.0
Net watthours per total ton-mile	18.65	27.7
Number of runs	5	12
Number of cars in train	22	12
Number of delays or stops per run	0.6	1.0
Total time of run in minutes	73.4	44.75
Time delayed on stopped—minutes	4.2	2.0
Running time, minutes	69.2	42.8
Maximum speed, m.p.h.	31.1	49.7
Average speed, m.p.h.	23.7	38.4

TABLE 3—COST OF STEAM OPERATION

	Total cost 465,750 train miles	Per train mile
Coal 22,040 tons (20,000 metric tonc)	$238,095	51.14c
Engine drivers and firemen	29,762	6.38
Mechanics and helpers (running maintenance)	13,227	2.84
Locomotive wipers	2,679	0.57
Lubricants and miscellaneous material	10,089	2.16
Total	$293,852	63.09c

TABLE 4—COST OF ELECTRIC OPERATION

	Total cost 465,750 train miles	Per train mile
Power—paid for at power company lines	$47,381	10.18c
Transformation of power from 88,000 V.A.C. to 3,000 volts D.C.	8,343	1.79
Engine drivers and assistants	19,024	4.08
Electricians and mechanics (running maintenance)	2,931	0.63
Locomotive wipers	1,640	0.34
Lubricants and miscellaneous material	10,607	2.28
Total	$89,926	19.30c

TABLE 5—REPAIRS AND HEAVY MAINTENANCE

	Steam		Electric	
	Total cost 465,750 train miles	Per train mile	Total cost 465,750 train miles	Per train mile
Labor	$13,512	2.90c	$6,250	1.34c
Material	18,303	3.93	3,928	0.84
Total	$31,815	6.83c	$10,178	2.18c

TABLE 6

	6.2 miles of 88,000 v. Transmission Line		71.4 miles Secondary Dist. System	
	Total cost 465,750 train miles	Per train mile	Total cost 465,750 train miles	Per train mile
Labor	$1,865.00	0.40c	$4,271.00	0.91c
Material	272.50	0.06c	559.50	0.12
Total	$2,137.50	0.46c	$4,830.50	1.03c

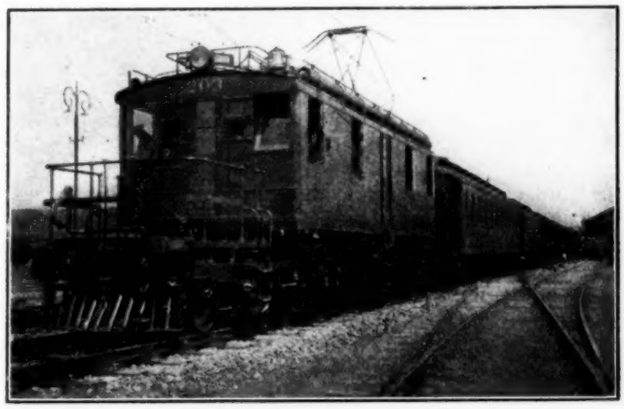
TABLE 7

	Cost per train mile	
	Steam	Electric
Operating trains	63.09c	19.30c
Locomotive repairs	6.83	2.18
Transmission line operation and maintenance	....	0.46
Trolley line operation and maintenance	....	1.03
Total	69.92c	22.97c

For the final total economy of electric service over steam, Table 7 shows the costs on the basis of a year's service or 465,750 train-miles.

As a result of the saving shown by the initial installation, the Paulista Company decided to extend its electrification and in the early part of 1923 orders were placed for the material for electrifying 50 additional route-miles of single track. This included 88,000-volt high tension line, secondary distribution and 3,000 kw. substation materials, also five 3,000-volt d.c. switching locomotives.

Costs and performance data in this article have largely been taken from the report of Eng. F. de Monlevade, In-



An Electrically Operated Passenger Train

spector Geral da Companhia Paulista de Estradas de Ferro published in the Revista Brasileira de Engenharia.

The costs given on maintenance and operation are based on an exchange of 8 milreis equal to $1.00 which is the average exchange over the period for which the costs are given. While the comparison of steam and electric service are exact, the costs in American money are not strictly comparable with services in this country, due to the varying exchange.

Fuel Pile and Wood Burning Locomotive on the Paulista Railway

THE PRESIDENTS and other representatives of 13 railroads using the La Salle street, Dearborn and Grand Central terminals in Chicago, met with the city officials on March 6 and agreed to co-operate actively in developing plans for new passenger and freight terminal facilities. J. E. Gorman, president of the Chicago, Rock Island & Pacific, was selected as chairman of a committee of the railroad executives to call a later meeting for determining upon a plan of procedure.

Western Roads Perfect Trackage Agreement

Southern Pacific and Western Pacific to Make Joint Use of Facilities in California and Nevada

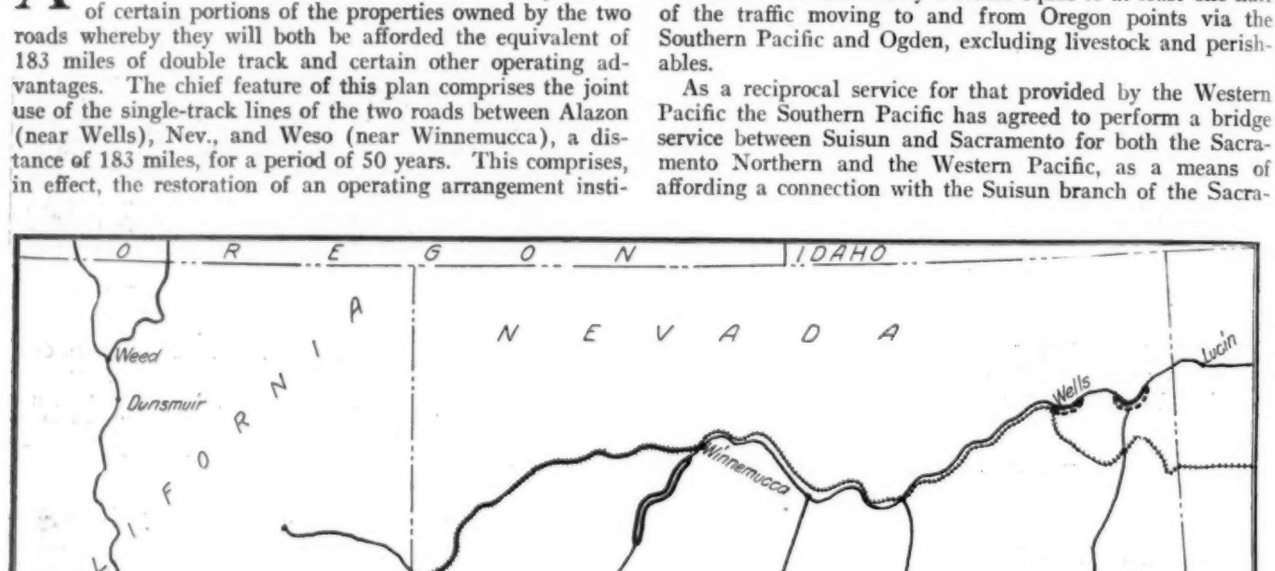
AN AGREEMENT has just been reached between the Western Pacific and the Southern Pacific for the joint use of certain portions of the properties owned by the two roads whereby they will both be afforded the equivalent of 183 miles of double track and certain other operating advantages. The chief feature of this plan comprises the joint use of the single-track lines of the two roads between Alazon (near Wells), Nev., and Weso (near Winnemucca), a distance of 183 miles, for a period of 50 years. This comprises, in effect, the restoration of an operating arrangement instituted by the United States Railroad Administration but which was discontinued at the end of government control.

Another feature of the plan is the utilization of the tracks of the Western Pacific from Weso to Oroville, Cal., and those of the Sacramento Northern from Oroville to Chico by the Southern Pacific as an alternate and shorter route for traffic moving between points in the northwest and the overland route. Under existing trackage of the Southern Pacific, any traffic from the Shasta route to the overland route must move by way of Chico and Marysville to a junction with the overland route at Roseville, a short distance east of Sacramento. The distance from Chico to Weso by this route is 388 miles whereas the distance over the Sacramento Northern and the Western Pacific by way of Chico, Oroville and Weso is 341 miles, thus affecting a saving of 47 miles. The agreement provides that this bridge service by way of the Western Pacific is to be utilized by a traffic equal to at least one-half of the traffic moving to and from Oregon points via the Southern Pacific and Ogden, excluding livestock and perishables.

As a reciprocal service for that provided by the Western Pacific the Southern Pacific has agreed to perform a bridge service between Suisun and Sacramento for both the Sacramento Northern and the Western Pacific, as a means of affording a connection with the Suisun branch of the Sacramento Northern which is isolated from the rest of that property.

A further provision of the contract provides that the Pacific Fruit Express Company, owned jointly by the Southern Pacific and the Union Pacific, shall be given a lease to operate its own refrigerator cars and also all Western Pacific refrigerator cars under conditions that assure equitable treatment to the shippers of perishable products on both the Southern Pacific and the Western Pacific. This feature of the plan is simply the formal consummation of an arrangement which has been in effect during the past season.

The arrangement for double-track operation affected by the agreement between the two properties is of particular advantage to the Southern Pacific in that it fits well into the project which the Southern Pacific now has under way



Relation of the Western Pacific and Southern Pacific in California and Nevada

for greatly increasing its double track mileage on the overland route. Previous to the inception of this plan there were 290 miles of double track on the 783 miles of line between Ogden and San Francisco. This 290 miles comprised 168 miles of continuous double track from San Francisco to the west approach to the Sierra Nevada mountains, 35 miles on the east approach between Truckee and Reno and 87.4 miles in several independent stretches in Nevada. This double track is now being amplified by second track construction authorized last year embracing 40 miles in a crossing of the Sierra Nevada mountains and 28 miles comprising two short stretches in Nevada. This addition, together with the 183 miles afforded by the agreement with the Western Pacific, will raise the total mileage of double track to 540, and leave only about 147 miles of single track on the overland route west of Lucin.

The bridge route over the Western Pacific between Chico and Weso will be of considerable advantage to the Southern Pacific in handling traffic between the northwest and the east. This business, which consists primarily of lumber, is moved in the face of severe competition with the Union Pacific. Consequently, the saving of time to be effected by a shortening of the distance by 47 miles, is an important item to be taken into consideration. Another feature of no little moment in this connection is that the handling of this traffic over the bridge line will relieve the Southern Pacific main line of this traffic over a distance of 310 miles, this being an important consideration at the time when the perishable fruit movement is at its height.

The advantage accruing to the Western Pacific as a consequence to the arrangement effected with its competitor, arises primarily from the increased traffic and therefore greater revenue which is to be obtained under this plan. The contract also carries with it a proviso that the Western Pacific must carry out an improvement in the condition of this line to a standard that will insure the proper handling of the greater traffic, and to insure that this may be carried out the date for making the plan effective has been postponed to August 1 in order that the Western Pacific will be given ample time to complete the rehabilitation program.

What Does It Cost to Build an Organization?

Periodic Reducing and Rebuilding of Forces Expensive—Cost Data Must Be Developed

By J. C. Clark

WHEN DEALING with the human element it is extremely difficult to determine exact values, because they vary with each individual unit and even the individual varies from day to day. No one denies that there is a considerable cost to the railroad in training an employee for the responsible positions and there is some cost attached to the employment of the most ignorant laborer.

Take the case of the expert mechanic. He enters the service as an apprentice. The company pays the salary of an instructor, provides space where instruction may take place, provides tools and machines and pays a wage to the apprentice. It is obvious that for a considerable period the value of the work performed by the apprentice is far below the cost of the instruction. The period during which the cost is greater than the return is lengthened or shortened according to the ability of the man, so that it is very difficult to obtain an exact figure of the cost of instruction, and consequently average costs are the only ones that can be relied upon. Furthermore, when instruction is completed and the apprentice becomes a full-fledged mechanic, his value to the employer will vary in every case. Even though the problem is difficult and exact figures practically impossible to obtain, it is possible to determine average costs that are dependable.

Employment Service

The first item which enters into the cost of building an organization is that of employment. An employment service that is capable of selecting the highest type of individual is essential in building up an efficient organization. At times when there are large numbers of idle men an adequate supply of labor can be obtained very easily, but it is apparent that at such times it is only the least efficient and desirable class of labor that is unemployed, for the simple reason that in all industries where seniority rules do not apply, the least desirable employees are cut off when forces are reduced. Practically the only way to secure the proper type of employee is to take the young men as they come from school, make every effort to place them in the position that is best suited to their abilities and see that they are given the proper training.

Cost of Training

The second item is the cost of training. This of course includes the value of the supervising officer's time spent in instructing a new hand. In some branches of the service, such as train, engine and yard service, it is customary to pay brakemen and firemen for their student trips before they are given a place on a crew. On some roads it is the practice to train telegraph operators in schools for that purpose, which is also an item in the cost of training. Where educational motion picture films are shown and lectures provided, air brake and rules instruction cars sent over the road, foremen's clubs organized, all such activities are included in the cost of training. It is unnecessary to go into more detail, but the practical railroad man can think of a great many items of cost in the training of an employee, no matter in what branch of the service he may be employed.

Other Costs

The third item in the cost of building an organization is that of extra labor. New employees are never able to perform the normal amount of work during the time they are learning the job. If every employee in a department could develop the maximum efficiency, there is no question that the total number of employees could be reduced.

The fourth item is the cost of extra power, lubricants and materials used on account of reduced output. This item of course would not apply in certain branches of railroad service. It is quite evident, however, that if every mechanic in the shops were thoroughly trained and efficient, the output would be greatly increased, with less power and with reduced materials.

The fifth item of cost is very closely related to the fourth. If the maximum efficiency could be maintained in all shops, fewer machines and less floor space would be necessary,

which of course would reduce plant investment, depreciation, insurance, taxes and repairs.

The sixth item of cost is that of work spoiled by new operatives in excess of the normal rate of spoilage by experienced workmen. This would apply in the mechanical department principally, but it would also apply in other departments to a certain extent and it should also be considered in the case of brakemen, yardmen and firemen where damage to equipment is caused through inexperience.

There are a great many other costs that enter into the total, such as greater wear and tear on machinery, which includes the greater cost of repairs due to breakage and the greater depreciation due to hard usage caused by inexperienced men and the necessity of running machines a longer period in order to obtain the given output. This applies to the increased time the inexperienced engineer or conductor will require to get over a given division. There is also the increased cost of accidents and claims resulting from accidents, due to greater accident frequency during the learning period. Probably the most difficult cost to estimate is the loss of good-will due to inefficient service given to shippers and the traveling public by inexperienced employees. While this item is largely intangible, it is very real and has a great deal to do with the success or failure of railroad operation.

How to Estimate the Costs

It is evident that there are a great many items that enter into the cost of building an organization. How is the best way to estimate these costs? As indicated above, only average costs can be obtained. It would be possible of course to determine the actual cost in the case of any one individual employee, so in order to determine the average costs it would be necessary to determine the actual cost for a sufficient number of individual employees to get an average that would be fairly accurate. Probably the best way is to organize a committee for each branch of the service to make a thorough investigation, considering all the factors that enter into the problem and getting the information at first hand from employees and supervising officers actually doing the work. No doubt this procedure would require considerable time and even then the figure obtained would not be dependable after the lapse of a year or two. However, after the original estimates have been made it will not be difficult to make revision when changes occur because of new methods or better facilities.

Working in the Dark

For years past it has been the custom on a great many railroads to cut maintenance forces whenever business becomes slack, without knowing the cost of building these organizations up to the point of efficiency again when it becomes necessary. *If the financial managers of the railroads had a reliable average cost of training men, they could plan with some degree of intelligence—as it is today they are working in the dark.* Under present conditions the management does not know whether it is actually saving money by reducing forces or not. There is no doubt about the immediate saving, but many things indicate that the ultimate result is a far greater cost.

In an address before the Federation of Engineering Societies, November 20, 1920, Herbert Hoover made the following statement: "It is primary to mention a three-phase waste in production; first, from intermittent employment; second, from unemployment that arises in shifting industrial currents; third, from strikes and lockouts." It is evident that Mr. Hoover was thinking of the waste referred to above, as well as the waste due to loss of wages by employees. It is certainly a sheer waste for an employer to dismiss a well-trained employee if it is possible to retain him, because in so doing he automatically throws away his investment in that employee. The employer may hope to recapture this investment by re-employing the same man when conditions have changed and no doubt this happens in a great many cases; but even when the employee comes back to his old job after a period of depression, he does not have the same feeling of loyalty towards the employer that he had before the lay-off. The employee and his family have suffered through loss of wages and he fears that the same thing may happen again. He is consequently on the lookout for some other line of work that offers more permanent employment.

A lay-off of this kind also has a very marked effect on foremen, because they know at first hand the difficulty of rebuilding their organization. There is no doubt that it is possible to stabilize railroad employment in a great many branches of the service, but it cannot and will not be done until the costs of rebuilding the organization have been worked out and furnished by the managements to the financial officers in control, so that these officers can be guided by the actual facts.

Hearing on Railway Labor Bill

WASHINGTON, D. C.

HEARINGS on the bill to repeal the labor provisions of the Transportation Act and substitute new machinery for the adjustment, mediation and arbitration of railway labor disputes, introduced in the Senate by Senator Howell and in the House by Representative Barkley at the instance of the railroad labor organizations, were begun on March 18 before a sub-committee of the Senate committee on interstate commerce, composed of Senators Couzens, Dill and Gooding. D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, and Donald R. Richberg, counsel for the railroad labor organizations, gave brief statements in support of the bill, which is endorsed by 20 organizations of railway and marine employees and by the American Federation of Labor, and the representatives of the railroads are to be heard on March 28 and 29.

Mr. Robertson, in explaining the purpose of the bill, said that the railroad labor organizations in trying to present a united constructive program for the handling of railroad labor controversies have been working on this bill for 18 months. After the work of committees and conferences, the bill has been studied during the past nine months with the assistance of attorneys, during which time it has been redrafted six times and it has also been presented to many members of Congress and, at the suggestion of the President, to Secretary Hoover of the Department of Commerce and Secretary Davis of the Department of Labor. The labor provisions of the Transportation Act, Mr. Robertson said, have failed to insure or promote industrial peace, largely because they represent the result of a compromise, which includes the inconsistent principles of persuasion and compulsion and the results have pleased no one. He took the position that new legislation is necessary because the organized employees are unitedly opposed to the present law, while he said the railway managements have openly flouted it except when it was advantageous to them not to do so. Under this law, he said, nothing was settled in conference and the board was so swamped with minor controversies that great delay has resulted and he declared that there are now pending before the board 845 cases which have been before the board from three months to three years. He also criticized the attitude of the board on several occasions and particularly that of Chairman Hooper. The bill now proposed, Mr. Robertson said, lays primary emphasis on the adjustment of grievances or controversies by conference, to be followed, if necessary, by mediation and voluntary arbitration. He

referred to it as an industrial code made up from the written and re-written principles established through many years of experience.

Mr. Richberg presented a digest of the provisions of the bill which included the following explanatory statement:

Purpose of the Bill

The purpose of the proposed Railway Labor Act is to insure continuity and efficiency in the transportation system of the country by providing means whereby the management and the employees, through representatives of their own choosing, shall confer on the problems of the "human side" of railroading, and through such conferences, first, enter into collective agreements respecting wages and working conditions, and, second, adjust differences of all kinds. To carry out this purpose a duty is imposed on both parties—"to exert every reasonable effort to make and to maintain agreements concerning rates of pay, rules and working conditions." Disputes over proposed changes of rules or rates of pay, or over the application of agreements, are to be settled in conference, if possible, and the machinery of Boards of Adjustment, and a Board of Mediation and Conciliation or reference to arbitration is to be resorted to only when a conference cannot produce an agreement.

The proposed legislation utilizes the successful provisions of former acts (the Act of 1886, the Erdman Law, the Newlands Law, and Title III of the Transportation Act) and seeks to avoid the weaknesses that developed in the practical operation of those laws.

Machinery Provided

The proposed act provides four ways in which differences between the men and the management can be adjusted:

1. Conferences

The primary emphasis is laid on conferences. Section 3 (A) (1) imposes a mandatory duty upon the parties involved in a dispute to confer. Such conferences must be held whether a dispute is one "arising out of grievances, or the application of agreements concerning rates of pay, rules or working conditions, or proposed changes in rates of pay, rules or working conditions." While there is no duty upon the parties to *decide* such disputes in such conferences, the parties, through their representatives, must meet and endeavor to agree.

The framers of this bill, which has been drafted by practical railroad men, have provided that in these all-important conferences the workers shall have genuine representation, otherwise such conferences are useless. If a management is permitted to exert pressure to influence the choice of conferees, or to refuse to meet conferees whom it does not select or approve, the satisfactory results of conferences are impossible and autocratic dictation is made doubly offensive by the pretense of democratic co-operation. The much censured conduct of certain railroads in seeking to control the choice of representatives of its shop and clerical forces shows that the effectiveness of the conference system depends entirely on this principle of independence.

The bill, therefore, provides (Sec. 3-A-2) that the representatives shall be designated by the parties in such manner as their *own organization* shall decide, "without interference, influence, or coercion exercised by either party over the self-organization or designation of representatives by the other, and it shall be deemed a violation of the obligation herein imposed upon carriers for any carrier * * * to interfere with or to attempt to influence or control, directly or indirectly the organization of employees or subordinate officials, or participate in the functioning thereof or the designation of employee or subordinate official representatives." It is because *voluntary* agreements between the parties immediately concerned is the foundation of the entire bill that so much emphasis is placed upon this matter of non-interference by one party in the selection of the representatives of the other. Moral and legal obligations to fulfill a contract arise only when the parties are bound by their self-chosen representatives.

2. Boards of Adjustment

If a dispute (except disputes involving *changes* of rules or wages) cannot be disposed of to the satisfaction of the parties in a conference, the act imposes upon the parties *the duty* to refer such disputes to the appropriate Board of Adjustment, where the controversy will, if possible, be decided.

(The Boards of Adjustment have nothing to do with changes of rules or working conditions. Controversies over such questions may be settled (1) in conference; (2) through mediation, or (3) by arbitration. The Boards of Adjustment are therefore concerned solely with questions of operation under existing agreements. It is hence appropriate and desirable that they should be composed exclusively of practical railroad operators.)

The members of the Boards of Adjustment are government officers appointed by the President by and with the advice and consent of the Senate. However, these boards are not third party tribunals, but are an extension of the conference plan on a national scale, where men skilled in railroading, representing both managements and the employees, can try to adjust the human problems of their common business.

There are four such boards, divided roughly as follows:

Board No. I.—Train service men.
Board No. II.—Shop and mechanical workers.
Board No. III.—Clerical and station workers, stationary firemen and maintenance-of-way men.
Board No. IV.—Marine workers.

The organization of Board No. I. is typical. This board is composed of 14 members. Seven are representatives of management, appointed by the President from not less than 14 names presented by the carriers. Seven are representatives of labor, appointed by the President likewise from a list of not less than 14 nominees, each of the "nationally organized crafts" within the classifications embraced by Board No. I. being authorized to nominate two men.

Again it should be emphasized that these are not third party tribunals or boards of arbitration. The members are not expected to stand "impartially" between those who bring controversies before them for adjustment. There is no "public member" or "neutral" or "umpire." Long experience has convinced railroad men (employers as well as employees) that the continuity of railroad service can most often be secured, not through referring technical problems to individuals enjoying so-called "impartiality" (individuals unfamiliar with the problem of the engine cab, the train, the yard, the ship, and the machine shop) but rather through providing disputants with a full and fair opportunity to present their claims before an equi-partisan board. The successful operation of just such boards for years on various railroads and covering all railroads during federal control and some of the gratifying results of similar machinery in Canada in recent years have demonstrated the effectiveness of this method of settling controversies.

The bill provides in addition for the exceptional situation where the parties may be unable to adjust their differences within the industry itself, either in conferences, or before the appropriate equi-partisan Board of Adjustment. In that event—(a) the Board of Mediation and Conciliation may be invoked or may intervene; or (b) there may be submission of the dispute to arbitration.

3. Board of Mediation and Conciliation

The composition and the function of this board is quite different from the intra-industry machineries heretofore discussed. This board is made up of five commissioners, appointed by the President. They are all to be impartial and not associated in interest with either the carriers or the unions. Unlike the present Railroad Labor Board, this board is not an impotent court, authorized to "decide" cases but without power to make its decisions effective. The creation of this board would inaugurate a return to the successful mediation provisions of the Erdman and Newlands acts.

The functions of the commissioners are three-fold:

(*a*) The board may try by mediation, to induce the parties to settle all disputes as to the application of agreements, which cannot be adjusted either in conference, or before the proper Board of Adjustment. The board may act either on the request of either party, or on its own initiative.

(*b*) The board may take similar action in the case of proposed changes of rules or wages, which have not been agreed upon in conference between the parties.

(*c*) If conferences, adjustment, mediation and conciliations have all failed to result in an agreement, the board shall endeavor to induce the parties to submit their differences to arbitration, under the conditions provided in the bill; and if this effort succeeds the board shall help to organize the arbitration proceedings.

4. Arbitration

The bill provides for voluntary arbitration of either class of disputes which have not been settled in conference, (1) of disputes regarding the application of agreements which have not been settled in conference or by a Board of Adjustment, or after mediation, or (2) of disputes regarding changes of rules or wages which have not been settled directly in conference or after mediation. In either event if the Board of Mediation has failed to bring about an amicable adjustment "the said board shall at once endeavor, as its final required action, to induce the parties to submit their controversies to arbitration" (Sec. 5-A). The Board of Arbitration may consist of three or six persons, as may be stipulated in the arbitration agreement. If a board of three is provided each party shall choose one; if a board of six, each party shall choose two. If the parties fail to agree upon the third arbitrator, or upon the fifth and sixth arbitrators, for a board of six, it is the duty of the Board of Mediation to choose the one or two disinterested arbitrators (Sec. 5-D). The form and contents of the agreement to arbitrate are set forth in Section 7-C and comprise

a re-statement of the best provisions of arbitration agreements under previous laws. In this agreement it is provided that the parties shall agree to faithfully execute the award and that it shall be filed with the clerk of the appropriate district court and judgment shall be entered upon it; provided, however, that the court shall have power to set aside the award only upon the three grounds:

(*a*) That the award or the proceedings were not in conformity with the act, or,
(*b*) That the award does not conform to the agreement to arbitrate, or,
(*c*) That there was fraud or corruption which affected the result of the arbitration.

These provisions of the agreement to arbitrate whereby the parties expressly limit the power of judicial interference are for the purpose of preventing the delays or harassments of litigation whereby the purposes of arbitration are defeated. This marks an important advance over previous legislation.

5. General Provisions

There are certain provisions of considerable importance not covered in the previous description of the machinery provided in the act, which should be briefly described.

(*a*) Section 6 requires 30 days' written notice of any changes of rules or wages and an opportunity for consideration of such changes in conference and for the use of the services of the Board of Mediation before such changes may be made effective, imposing a penalty that in cases of changes without notice or prior to fulfilling the requirements of the act, such changes shall be void and the offender liable in damages to double the amount of the loss occasioned by such unlawful action. Section 4-B provides for an interpretation by a Board of Adjustment of any decision concerning the application of which a controversy may arise and Section 5-C makes a similar provision regarding interpretation by the Board of Mediation of agreements reached through mediation. These provisions are intended to prevent the re-opening of controversies which have been presumably settled, and to prevent either party from destroying the value of a settlement through an unfair interpretation of the agreement of settlement.

(*b*) Section 7-A (2) specifically provides that the refusal of a party to submit to arbitration shall not be considered as a violation of a legal obligation, in order to prevent attempts to force parties into arbitration by judicial action. It is the underlying principle of the entire act that if opportunity is provided for ample hearing and fair consideration of matters in disagreement, the representatives of employers and employees can be relied upon to adjust amicably their differences as they are more vitally interested than any other persons can be. The use of coercive methods to force agreements or to compel men to serve under unacceptable conditions is not only opposed to American principles, but has been shown to be destructive of, and not productive of, harmonious industrial relations.

(*c*) In like manner, although arbitration awards are binding upon the parties thereto, it is especially provided in Section 7-D (8) that nothing in the act shall be construed to require an individual employee to render compulsory service. It should be obvious that although organizations properly may be bound by their contracts and the members equally bound while rendering voluntary service, no individual can be compelled to render service so long as the Constitution of the United States forbids involuntary servitude.

The Railway Labor Act is presented as a constructive measure for the adjustment of industrial controversies that affect the transportation service in such a manner as to promote the co-operative efforts of employers and employees, to insure harmony in and to improve the efficient operation of the American railroads.

Mr. Richberg said that the great difficulty in getting arbitration in the past has resulted from the difficulty of getting satisfactory arbitrators and that this bill provides an established practice for the selection of arbitrators which should remove many causes of dispute. In reply to Senator Couzens, he said the labor organizations object decidedly to compulsory arbitration on the ground that an industrial court necessarily is unlike courts that settle questions by applying established law to questions of contractual relations. An industrial court, he said, is not asked to decide as to the law, but is essentially a legislative body to determine questions not of contract or law, but of economics and social conditions. Compulsory arbitration, he said, would be a long step toward socialism because the government cannot fix wages without ultimately fixing prices.

Alfred P. Thom, counsel for the Association of Railway Executives, asked for a few days' time before proceeding with the testimony on behalf of the railroads of Hale Holden, chairman of the association. He said there are many features of the bill which ought to be discussed and he thought it might require three or four sessions of two hours. Senators Gooding and Dill objected to any delay and to allowing that much time, saying that the railroads ought to be ready to proceed at once and that if the committee expected to legislate it must act promptly. Mr. Thom pointed out that the labor organizations had spent 18 months in preparing the bill. Bird M. Robinson, president of the American Short Line Railroad Association, asked for ten days in which to give representatives of short lines an opportunity to come to Washington and Senator Couzens finally adjourned the hearing to March 28, saying that the testimony of the railroads should be completed within two days.

Proposed Revision of Southern Class Rates

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION has made public a proposed report by Commissioner Joseph B. Eastman in the Southern Class Rate Investigation, instituted by the commission on its own motion on February 6, 1922, in which he recommends findings by the commission which embody a plan for a complete revision of the interstate class rates within Southern territory and between Southern and Official territories, based upon a single distance scale. The report has been submitted to all interested parties, Mr. Eastman says, in the realization that conclusions ought not finally to be adopted in an investigation of this magnitude and complexity until they have been put to the test of searching analysis and criticism by those whom they affect. Forty days will be allowed for the filing of exceptions and the case will then be set down for oral argument. In a preliminary statement the report says:

"In a notice issued soon after the investigation was instituted on February 6, 1922, we stated that the general rate level within southern territory and in other parts of the country would be determined in the general rate investigation then under way. Reduced Rates, 1922, 68 I. C. C., 676. Therefore, it would not be the primary purpose of this inquiry either to add to or subtract from the aggregate revenues of the carriers, but rather to adopt a class-rate structure which will be as simple as it can be made, with due regard for the public interest, and free from undue prejudice, and which will serve the purposes that class rates ought to serve.

"Intrastate rates are not within the scope of the investigation, but we stated that one of the results to which we are 'particularly desirous that the investigation may ultimately lead is the establishment of a greater degree of harmony between interstate and intrastate rates within southern territory.' The notice went on to say that if this result is to be accomplished, 'it will be necessary for the commission to fix interstate class rates which may serve as a reasonable and proper guide to the state commissions in the adjustment of the intrastate class rates.' To this end we sought the co-operation of the southern state commissions, and a committee representing them was appointed which sat with our representatives throughout the hearings. In order that the situation with respect to intrastate rates might be clearly in mind, evidence in regard to such rates was freely received. The co-operation of the southern state commissions has been of notable aid in the conduct of the inquiry.

"Hearings were held at Atlanta, Ga., Asheville, N. C.,

New Orleans, La., Cincinnati, Ohio, and New York, N. Y., beginning May 22, 1922, and ending March 14, 1923. The transcript of testimony contains over 15,000 pages and more than 2,000 exhibits were introduced. The record represents an enormous amount of careful, painstaking, and intelligent labor, and if we are unable to reach a satisfactory conclusion, it will not be because of any neglect upon the part of carriers or shippers."

The findings recommended are shown below in consecutive order:

1. That no good reason has been shown for making interstate class rates between any two points in southern territory relatively high in order that corresponding rates for other hauls may be made relatively low. Stated differently, no adequate commercial or other reasons have been shown for grouping or relating interstate class rates in such a way that the rates between any two points are made substantially higher than the normal level.

2. That the normal level of interstate class rates within southern territory should be based upon a distance scale or scales sufficiently extended so that hauls of all lengths will be covered.

3. That no reason has been shown for making the normal rate level higher than it otherwise would be made, in order to offset possible material reductions below the distance scale basis.

4. That a single scale of distance rates should be used as the basis of maximum interstate class rates between points within southern territory.

5. That in applying this scale, distances in Kentucky, Tennessee, North Carolina, and Virginia should be computed at 90 per cent of actual mileage.

6. That distances on standard lines in Florida, other than the Florida East Coast, south of the line of the Seaboard from Jacksonville to River Junction should be computed at 110 per cent of actual mileage.

7. That in all other parts of southern territory distances on standard lines should be computed at actual mileage, except that 50 miles may be used as a constructive distance for the car-float ferry on the Tennessee River in Alabama between Hobbs Island and Gunters Landing.

8. That no sufficient reason has been shown for joint-line differentials or arbitraries, but that the absence of such differentials is a factor which should be given some weight in determining the level of the distance scale.

9. That class percentage relationships should be uniform for all traffic, whether intraterritorial or interterritorial, which is governed by southern classification, and that these uniform percentage relationships should be as follows:

Classes	1	2	3	4	5	6	7	8	9	10	11	12
Percentages ..	100	85	70	55	45	40	35	30	25	21	18	15

10. That the classes should be numbered from 1 to 12, inclusive, the present classes A, B, C, and D becoming, respectively, classes 8, 7, 9, and 10.

11. That nothing has been shown of record which would justify the commission in requiring the maintenance or establishment on less-than-carload traffic of interstate exceptions to the southern classification.

12. That the maximum reasonable class rates for interstate application between points in southern territory and over routes lying wholly within such territory, except between points in Virginia and points in North Carolina, and except to and from points on the weak lines and short lines hereinafter discussed, should be determined by the distance scale set forth in Appendix J. (Not shown in *Railway Age*).

13. That the maximum reasonable class rates for interstate application between points on the weak lines and short lines above described which operate locally interstate, other than such as are under common control or management with standard lines, should be based upon the distance scale shown in Appendix J, using in the application of the scale constructive mileages equal to 150 per cent of actual mileages.

14. That the maximum reasonable class rates for interstate application between points on the weak lines and short lines above described and points on the lines of other carriers within southern territory should be based upon the distance scale shown in Appendix J, using in the application of the scale constructive mileages for the haul on the weak line or short line equal to 150 per cent of actual mileages, except that in the case of the Florida East Coast such constructive mileages should be equal to 125 per cent of actual mileages.

15. That in the application of the distance scale the shortest possible route between any two points should be used embracing as a maximum the lines or parts of lines of no more than three carriers up to 200 miles, four carriers for distances from 200 to 500 miles, and five carriers for greater distances, via existing connections for interchange of carload traffic; but in computing the mileage over any such route constructive mileage should be employed so far as it is authorized for the whole or any part of the route, as hereinbefore provided.

16. That through rates lower than the combination of local rates to and from the boundary line should be established between official and southern territories, and that there is no logical reason why such through rates should be relatively higher than the rates established within southern territory.

17. That through rates between official and southern territories should be governed by the southern classification and by the standard class percentage relationships herein approved; but that provision should be made in the tariffs for the alternative application of combination rates where lower than the joint rates, and that the difference in class percentage relationships in southern and official territories is a factor to be considered in the fixing of the basic joint first-class rates.

18. That findings 1 to 4 and 8 to 11 inclusive with respect to intraterritorial class rates may be applied in principle to class rates, all-rail, water-rail and rail-water-rail, between official and southern territories.

19. That the maximum reasonable class rates for interstate application all rail between points in official territory and points in southern territory, except between points in eastern territory and points in Virginia and North Carolina, and for similar application between points in southern territory where part of the haul is through official territory should be based upon the distance scale set forth in Appendix J, with the proviso that in no case shall the through rate exceed the lowest combination of local rates. In applying this scale distances should be computed in accordance with finding 15, using constructive mileage equal to 90 per cent of actual mileage for that portion of the haul which is in official territory, constructive mileage equal to 110 per cent of actual mileage for that portion of the haul which is in Florida, constructive mileage equal to 150 per cent of actual mileage for that portion of the haul which is over any of the weak lines or short lines in southern territory hereinbefore described, and actual mileage in all other instances.

20. That it will constitute undue preference of the gateway point and undue prejudice to the point in southern territory to establish and maintain interstate class rates, all rail, between points in official territory and points in southern territory (except between points in eastern territory and points in Virginia and North Carolina), or between points in southern territory where a portion of the haul is in official territory, which exceed rates made 83-1/3 per cent (five-sixths) of the combination of first-class local rates to and from the gateway between the territories, rates for the other classes being determined by the standard percentage relationships herein recommended.

21. That the nonconcurrence plan of publishing rail-water-rail rates between interior points in eastern territory and interior points in southern territory should be discontinued, and that joint rail-water-rail class rates are necessary and desirable in the public interest and should be established and maintained between such points in all cases where maximum rail-water-rail rates, determined in the manner hereinafter recommended, are equal to or lower than maximum all-rail rates between the same points, determined in the manner hereinbefore recommended.

22. That in applying the distance scale herein recommended, as a guide in the determination of water-rail class rates from Baltimore to points in southern territory, other than in Virginia and North Carolina, the following constructive distances should be used:

	Miles.
Baltimore to Norfolk	125
Baltimore to Charleston	300
Baltimore to Savannah	300
Baltimore to Brunswick	325
Baltimore to Jacksonville	325

23. That in determining maximum reasonable class rates by water and rail from eastern ports to interior points in southern territory, other than in Virginia and North Carolina, the rates from Washington and Alexandria should be the same as from Baltimore, and the following differentials, first class, over Baltimore should be observed from other north Atlantic ports, the rates for the other classes being determined in accordance with the standard percentage relationships herein recommended:

	Cents.
Philadelphia	6
New York	6
Providence	13
Boston	13

24. That in determining maximum reasonable class rates, rail-water and rail-water-rail, from eastern interior points to southern destinations, other than in Virginia and North Carolina, one of the two following methods should be employed, whichever makes the lower rate:

(a) Add to the short-line constructive distance by water and

rail from Baltimore to the southern destination 90 per cent of the actual mileage from the eastern interior point to Baltimore and apply the distance scale.

(b) Add to the short-line distance by water and rail from Baltimore to the southern destination 90 per cent of the actual mileage from the eastern interior point to the nearest eastern port, apply the distance scale to the distance so obtained, and add to the result the differential of said nearest eastern port over Baltimore.

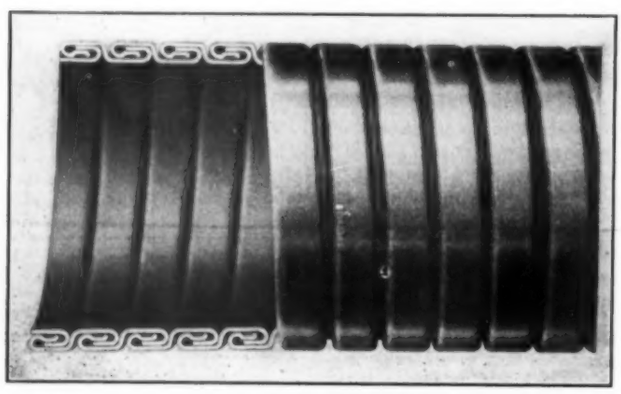
25. That in connection with the adjustment of rates herein recommended, fourth-section relief should be granted to weak lines or short lines upon the ground of financial disability, and to all lines upon the ground of actual or constructive circuity, such relief to be limited to lines not excessively circuitous and to instances where the rates will not be less than reasonably compensatory.

Summarizing the findings, they embody a plan for revising all the interstate class rates within southern territory and between southern and official territories which are covered by the order instituting the investigation, under which plan these rates will be based upon a single distance scale. Recognition is given to certain broad differences in transportation conditions by the use of constructive mileages, lower or higher than actual mileages, for certain hauls. It has been the endeavor to construct the distance scale in such a way that it can justly and reasonably be used as a guide in the revision of intrastate rates for the purpose of bringing about proper harmony between interstate and intrastate rates within southern territory, and in such a way that it will afford a just and reasonable basis for the elimination of special state classifications, less-than-carload exceptions to the southern classification, and many less-than-carload commodity rates. In the case of the interterritorial rates, provision has been made for the alternative application of rates made 83⅓ per cent of the gateway combination of first-class rates, where that basis would be lower than the distance scale basis, in order that communities in southern border territory may not be subjected to undue prejudice in comparison with the gateway points. It is recognized that the distance basis should not be so rigidly applied as to lose the advantage of simplicity and convenience in tariff publication, and that groups of moderate dimensions may reasonably be used in the case of the longer hauls. The recommendations are also confined to maximum rates; no minimum rates are fixed, and the carriers for the present are permitted to publish rates lower than the maximum to the extent that this can be done without undue preference of and undue prejudice to particular localities.

The basis recommended is intended to supersede all adjustments heretofore prescribed by the commission with reference to all or any of the rates in issue. If the recommendations are finally adopted, an order should therefore be issued canceling outstanding orders to the extent necessary to accomplish this result.

Flexible Metal Hose Adapted

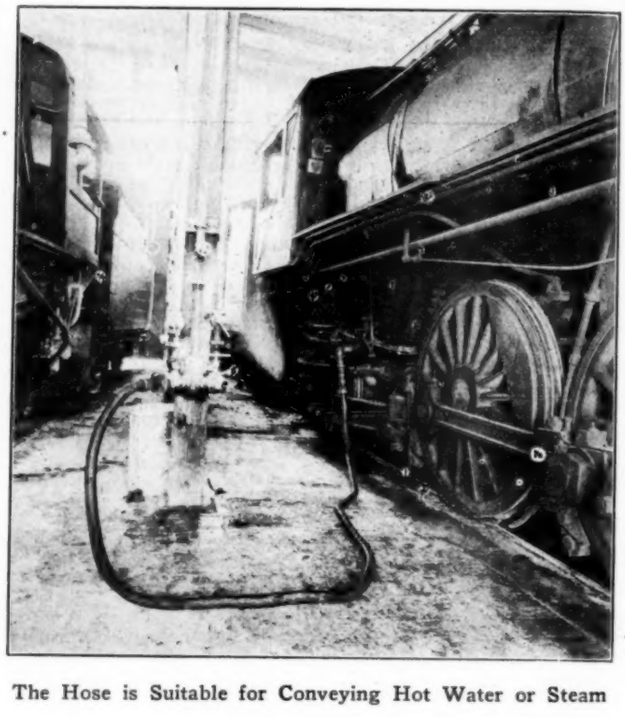
CONSIDERABLE interest is being taken by railroad men in the application of metal hose to railroad requirements. Rubber hose has been used extensively for many purposes, including the conveyance of hot water and steam under pressure. However, when it is used for hot water or steam, the rubber has a tendency to deteriorate rapidly and, as a result, has been the cause of many serious injuries to railroad employees. Unless rubber hose is renewed frequently, its use for such purposes involves an ever present element of danger.



Sectional View of Flexible Metal Hose Showing How the Strips are Interlocked

To eliminate such difficulties, the American Metal Hose Company, Waterbury, Conn., has developed a flexible metal hose that is adapted to a wide variety of uses. It is specially adapted to railroad work as a high pressure hose, which may be used for boiler washing, blowing boiler tubes and for general service around enginehouses. It may also be used for such work as unloading tank cars, carrying oil and other heavy or inflammable liquids.

As shown in the cross-sectional view, the hose is manufactured from a continuous strip of bronze or galvanized steel of high tensile strength. The strip is first profiled to the desired shape and then wound spirally over itself. During the winding operation, a packing in cord form is fed in place between the metal surfaces, thus making a tight joint. The hose is made in various sizes ranging from ⅜ in. to 6 in. inside diameter. The ⅜-in. hose can be bent to form a circle 9 in. in diameter, while the 6-in. hose will form a circle 72 in. in diameter. Two types are manufactured. It requires approximately 1,000 lb. per sq. in. of hydraulic pressure to burst a ¾-in. hose of the lighter type of construction, while the bursting pressure of the same size in the heavier type is 2,500 to 3,000 lb. per sq. in.



The Hose is Suitable for Conveying Hot Water or Steam

THE CANADIAN NATIONAL, in conjunction with the Chicago & North Western will establish through passenger service between Chicago, Winnipeg, Man., and Jasper National Park, Alberta, on June 7. Between Chicago and Duluth the route will be by way of the Chicago & North Western and between Duluth and Jasper National Park it will be over the Canadian National via Winnipeg. Cars will leave Chicago daily at 5:30 p. m., arriving at Duluth at 8:30 the following morning, and at Winnipeg at 9:15 p. m. that day, connecting with the Continental Limited of the Canadian National which arrives at Jasper National Park at 8:20 a. m. the third morning. Eastbound the cars will leave Jasper National Park at 9:30 p. m. and arrive at Chicago at 11:45 a. m. the third morning.

Public Affected by Locomotive Inspection

Indianapolis Commerce Chamber Condemns Action of Federal Inspectors on Pennsylvania in January

SUCH GENERAL DISLOCATION of service was caused on the lines of the Pennsylvania System entering Indianapolis, Ind., as the result of the wholesale condemnation of locomotives by representatives of the I. C. C. Bureau of Locomotive Inspection during the month of January, that business in the city and surrounding territory was seriously affected. Because of the apparent lack of consideration for the interests of the public, a committee was appointed by the Indianapolis Chamber of Commerce to determine whether the action taken was justified by the facts. Among its other findings, the committee states that apparently a concerted drive was made on the Pennsylvania during a period of extremely low temperatures when the best of motive power might develop minor defects; that the statement that the inspections on the Pennsylvania were merely routine work in line with usual procedure, is not borne out by the facts, and that even though drastic action were necessary, the same results could have been obtained by inspecting and condemning fewer locomotives on a given day, thereby avoiding serious interruptions to traffic.

The report of the committee was transmitted to Chairman Hall of the Interstate Commerce Commission on March 6 in a letter signed by Henry L. Dithmer, president of the Chamber of Commerce, which briefly recites the events leading up to the appointment of the committee and closes with the following paragraphs:

"On behalf of the shipping interests, who have been affected by the subject matter of this communication, the undersigned desires to express to the commission its keen appreciation of the prompt and effective manner in which it responded to the many complaints which were made in connection with this situation.

"We will appreciate an acknowledgment of this letter and the assurance of the commission that its Bureau of Locomotive Inspection will be required in the future to so conduct its inspections as to minimize the interference with the transportation service rendered by the carriers to the public."

Abstract of Report

An abstract of the committee's report follows:

At the outset, the committee desires to make it entirely clear that the shipping interests, for whom it is acting, are concerned in this situation only from the standpoint of the extent to which their business has suffered from the demoralized service of the Pennsylvania System, resulting from an apparently unreasonable campaign of locomotive inspection. The committee holds no brief for the Pennsylvania, the relations between the railroad and the federal authorities in reference to locomotive inspection, being a matter in which the public has no concern unless and until locomotive inspection results in undue interference with the service of the carriers and accordingly causes loss and inconvenience to the shipper.

Effect on the Coal Mining Industry

Nor has the shipping public any quarrel with the federal statute under which locomotive inspections are conducted. The law is, no doubt, essential to the safety of the traveling public and the employees in transportation service, but when the law is unwisely administered and the business of the shipping public suffers from such unwise administration, then they have a very definite interest in the situation.

Federal inspectors became active at Indianapolis, a hub point on the Pennsylvania, about January 12, 13 and 14. A large number of engines suddenly withdrawn from service about that time resulted in the closing of a number of mines on January 12. From that date on the situation gradually grew worse, reaching a climax along about January 28 and 29, when the inspectors suddenly appeared at Bicknell, Ind., on the Vincennes division. On the afternoon of Monday, January 28, they inspected four locomotives at Bicknell, all of which were ordered withdrawn from service. Two of these engines were engaged in serving the mines and hauling the miners' train between Bicknell and Vincennes. The withdrawal of these locomotives from service caused the railroad to annul the miners' train on the afternoon of January 28, forcing several hundred miners to walk back to Bicknell, a distance of more than three miles.

The engines which were condemned on the afternoon of January 28 were given attention during that night and the mines were furnished with empty cars for the day's start on the next day. The withdrawal of four engines from service on the morning of January 29 closed the mines at noon that day as the railroad was unable to give the mines the customary second or third switch. These mines are large tonnage producers and because of their size, have been served two or three times during the day. The condemnation of the engines again forced the miners to walk back to town as the engine which ordinarily handled the miners' train was withdrawn from service along with the other power. The mines did not operate on the afternoon of January 29, nor at all on January 30.

During the period, January 1 to 11, prior to the active campaign of the inspectors, all of the mines served by the Pennsylvania in Indiana lost but twelve and a fraction hours' running time due to transportation disability. A decided change, however, took place on January 12 and from that date to January 30, inclusive, Pennsylvania System mines suffered a total loss of running time of 713 hours, due to transportation disability.

During the first period (January 1 to 11) weather conditions were, on the whole, more severe than during the second period (January 12 to 30). During the first period, when the service was not interrupted by locomotive inspections, the mines lost but 2,138 tons account railroad disability, while during the second period, when the inspectors were unduly active, the mines lost a total of 153,544 tons.

These mines employ approximately 5,000 men and a conservative estimate of the loss in earnings to the miners in the second period would be $275,000. The loss of business to the coal operators, based on a mine run price of $2.50, is approximately $360,000. This is not the only loss sustained by the coal operators; the cost of producing such coal as was loaded during January was greatly increased, due to the loss of running time sustained in that month. Still another loss, and one which is difficult to determine, is the loss of the good will of their patrons through failure to serve them during the period referred to.

Movement of Agricultural Products Affected

The traffic manager of the Indianapolis Board of Trade stated that the transportation of last year's corn is especially hazardous during periods of extreme temperature variations due to the excessive moisture content in much of the corn then coming to market. Under these conditions any undue delay in transit from point of origin to market

affords opportunity for loss due to deterioration, to say nothing of the losses resulting from decline in prices before arrival of delayed shipments.

The representative of the Board of Trade also stated that it was not possible at that time to determine the approximate loss, as much of the grain was conditioned and still remains unsold at Indianapolis and other markets to which it was consigned after being reconditioned, but that it is safe to assume that the Pennsylvania will be presented with a number of heavy claims for loss and damage due to delays in transit.

Some of the delay sustained by these grain shipments occurred after the arrival at the outer Indianapolis yards. Lack of switching facilities, owing to the wholesale condemnation of power crippled the terminal service so badly that even after arrival the sampling of this grain for grading was unduly delayed. The consignments most seriously delayed originated in Illinois and Indiana and moved through Terre Haute and Logansport.

Utilities and Manufacturers

At Indianapolis and Fort Wayne, the service of the electric utilities was seriously handicapped by the failure of the Pennsylvania service. While these utilities had coal in storage, because of rain, snow and freezing weather, it was impracticable to utilize this reserve coal exclusively and to maintain their load it was necessary to mix with it a large per cent of freshly mined coal. Manufacturing plants depending on these utilities suffered from lack of power and in some instances were forced to suspend operations.

Jobbers, Wholesalers and Retailers

Many jobbers, wholesalers and retailers, who attended the conference, also complained of the fact that their business suffered from delays in delivery of freight.

General Service of the Pennsylvania

The dependability of the Pennsylvania service has come to be accepted as a standard by the shippers who are served by that railroad. The Pennsylvania has demonstrated time and again its ability to render satisfactory service even under the most unusual conditions, but it, of course, is obvious that this excellent service cannot be maintained if wholesale condemnation of power is indulged in.

Federal Inspection of Locomotives

The Assistant Chief Inspector Shirley at the meeting on February 2, stated in effect as follows: That federal inspectors are competent; that they have complied with the statute in the past and on the present occasion; that they have no discretionary powers, but must condemn any locomotive found to be unsafe; that the Pennsylvania had failed in the last six months of 1923 to maintain its locomotives up to the standard prescribed in the law.

An examination of the facts, the committee believes, will show that the Bureau of Locomotive Inspection apparently changed its standards of inspection in January, at least insofar as the Pennsylvania is concerned. The record of federal inspections for the Southwest region of the Pennsylvania by months for the last half of 1923 and for January, 1924, is shown in the table.

Month	Total inspected	Inspected and repaired without condemnation	Inspected and condemned	Inspected and approved
July, 1923	22	13	2	7
August, 1923	56	38	5	13
September, 1923	51	31	1	19
October, 1923	67	52	2	13
November, 1923	38	25	12	1
December, 1923	30	25	1	4
January, 1924	187	74	66	47

Conclusions

The committee draws the following conclusions from its investigation:

1—That the motive power of the Pennsylvania, at least in this district, during the last six months of 1923, was either in reasonably good condition or the Bureau of Locomotive Inspection did not apply, in that period, the same standards of inspections as were invoked in the month of January.

2—Total inspections of 22 engines out of 650 in July; 56 out of 657 in August; 51 out of 654 in September; 67 out of 679 in October; 38 out of 686 in November; 30 out of 680 in December, do not constitute a sufficient percentage of locomotive inspections on which to base any definite conclusion as to the condition of the motive power in that period. An average of 44 engines per month, or 6.5 per cent, of the total assigned were inspected in the six months' period and, of this average number per month inspected, four engines, or less than 10 per cent were condemned. In view of the limited number of engines which were inspected in the six months' period, the committee cannot understand how the federal inspectors arrived at the conclusion that the motive power of the Pennsylvania was, during that period, in the deplorable condition claimed by Inspector Shirley.

3—That the condemnation in January of 66—35 per cent—out of a total of 187 engines inspected, as compared with the month of December in which one engine was condemned out of a total of 30 inspected, would seem to indicate clearly that a different standard of inspection was applied in January than that which was observed in December.

4—That apparently a concerted drive was made on the Pennsylvania in January and was scheduled, intentionally or unintentionally, to occur during a period of diminished locomotive efficiency, due to extreme low temperature, when the very best of motive power might develop minor defects.

5—That this unwarranted action was taken at a time when the Pennsylvania, without any interference with its power, would have experienced difficulty in moving traffic expeditiously.

6—That when the Bureau of Inspection adopted the means which it felt were necessary to force the Pennsylvania to put its power in safe condition, the rights and interests of the shipping public were entirely ignored.

7—That while these inspectors were giving so much attention to the Pennsylvania, a fatal explosion occurred in a Big Four locomotive at Indianapolis and that two or three similar catastrophes occurred on other railroads about the same time.

8—That no fatal accidents occurred on the Pennsylvania immediately prior to the January inspections which would justify the conditions which resulted from such inspections.

9—That the inspections made on railroads which have recently experienced fatal boiler explosions, have not been as drastic, either before or after such accidents, as the inspections which were invoked on the Pennsylvania.

10—That the statement of Chief Inspector Shirley, that the inspections on the Pennsylvania were merely routine work and in line with the usual procedure, is not borne out by the facts.

11—That the claim of Chief Inspector Shirley that the inspections on the Pennsylvania in January were necessary on account of the steady decline in the condition of its motive power in the last half of 1923, likewise is not borne out by the facts.

12—That even though drastic action was necessary to correct condition on the Pennsylvania, the same results could have been obtained by inspecting and condemning fewer engines on a given day and thereby avoid serious interruption to traffic.

FLOWER SEEDS to the number of 11,000 packets are being sent out by the Canadian Pacific to its station agents who desire to beautify their station grounds. Bulbs to the number of 30,000 are also being distributed, and to the agents in Western Canada, the company proposes to send 100,000 trees and shrubs.

General News Department

The Chief Interchange Car Inspectors' and Car Foremen's Association will hold its next regular annual meeting at the Sherman hotel, Chicago, on September 16, 17 and 18.

The safety banner awarded annually by the Union Pacific to its shops showing the lowest accident record was awarded for 1923 to the shopmen at Denver, Colo., on March 13. Only 10 personal injuries occurred at these shops during 1923.

The grain elevator of the Reading Company at Twentieth and Shamokin streets, Philadelphia, was destroyed by fire on the night of March 11; estimated loss $300,000. Many firemen and other persons were injured by a falling wall, when fighting the flames.

Train No. 4055 of the New York, New Haven & Hartford, an afternoon local passenger train from Worcester to Providence, was derailed at Whitinsville, Mass., on Friday, March 14, and two coaches were overturned. The train was moving at about 30 miles an hour and 45 passengers were injured.

An order-in-council has been passed by the Dominion government authorizing the lease by the Canadian National Railways of the Inverness Railway in Cape Breton, N. S. The line, 61 miles in length, is to be leased for a period of three years from the Toronto bondholders. The annual rental is $25,000. At the end of the three years there is to be an option of purchase for $500,000.

Canadian Government Car Inspections

The number of cars inspected by the Dominion Board of Railway Commissioners in 1923 was 77,345, of which 3,458, or 4.47 per cent were found defective. The grand total of defects was 3,811 of which 80 were in couplers and parts, 619 in uncoupling mechanism, 164 handholds and 2,007 air brakes.

No More Exhibit Space for Atlantic City Convention

The exhibit committee of the Railway Supply Manufacturers' Association last week completed the assignment of all available exhibit space, 100,234 sq. ft., for the convention of Division V, Mechanical, American Railway Association, to be held in Atlantic City in June. Applications were received for 115,000 sq. ft. of space.

Correction

In an editorial in last week's issue on "Reduction in Rate Level in 1923," the average revenue per ton mile for 1921 was erroneously stated as 1.253 cents, when the correct figure is 1.275 cents. The average revenue per ton mile for 1923, which was 1.116 cents, therefore represents a reduction as compared with 1921 of 12.4 per cent, instead of 11.6 per cent as stated, and the nation's freight bill was $657,000,000 less than would have been paid in freight charges at the average rate of 1921, instead of $607,000,000 as stated.

Appropriations for Alaska Railroad

Some additional appropriations for the Alaska Railroad were included in a deficiency appropriation bill for the fiscal year 1924, passed by the House of Representatives on March 14. These were $245,000 for expenses of maintenance and operation (in excess of revenues), with a proviso that no part of this sum shall be expended for the construction of hotels; and $865,000 for bridge renewals, including filling old trestles, renewal of ballasting, bank widening, riprapping, reconstruction of telegraph lines, and additional rolling stock, to remain available until December 31, 1924.

Canadian Accident Report

Passengers, employees and others killed and injured in 1923 on Canadian railways numbered 295 and 3,597 respectively. The classification shows: derailments, 10 killed and 381 injured; public highway crossings, unprotected, 48 and 255; miscellaneous, 10 and 1,001; adjusting couplers, coupling and uncoupling, 7 and 107; falling off hand car, motor or velocipede, 6 and 167; application of air brake, 2 and 155; run down by engines or cars at stations or in yards, 42 and 79; jumping off train in motion, 7 and 90; attempt to board train in motion, 5 and 63; trespassing, 76 and 98.

Group Insurance on the I.-G. N.

The International-Great Northern has contracted with the Metropolitan Life Insurance Company, New York City, for group life insurance for employees in the shops and maintenance of way departments and station agents. For employees earning $150 a month or less the limit is $1,000 life insurance, $1,000 additional death and dismemberment insurance and weekly benefits of $10 a week for 13 weeks in the event of disability. For those who earn more than $150 a month, the life insurance and accidental death or dismemberment benefits are doubled, while the disability benefits are increased to $15 a week.

Titles for Railroad Men Who Served in Russia

The Senate on March 14 passed a bill to give military status to the Americans who were members of the Russian Railway Service Corps. The bill provides: "That the officers appointed by the President, and who served honorably during the war with Germany on and after April 6, 1917, in the Russian Railway Service Corps, organized by the War Department under authority of the President of the United States, shall have, as to such service, the status of commissioned officers in the United States Army with military rank corresponding to that designed in the President's appointment, and shall be entitled to a full and honorable discharge from the military service of the United States."

Pacific Railway Club Elects Officers

At its seventh annual meeting held at the Hotel Oakland, Oakland, California, March 13, 1924, the Pacific Railway Club elected the following officers to serve during the coming year: President, H. A. Mitchell, vice-president and general manager of the San Francisco-Sacramento Railroad; first vice-president, J. W. Williams, chief engineer, Western Pacific; second vice-president, A. S. McKelligon, general storekeeper, Southern Pacific; treasurer, R. G. Harmon, chief clerk, Denver & Rio Grande-Western Pacific; secretary, William S. Wollner, general safety agent, Northwestern Pacific.

Dr. Dudley's Will

Dr. Plimmon H. Dudley, consulting engineer of the New York Central, who died in New York on February 25, willed the bulk of his property to Yale University for the establishment of a professorship "which shall be devoted to research and instruction in connection with the history and development of the science of railway service." The New York Central Railroad receives his stremmatograph, the apparatus to record the movement of rails under the passage of trains, and his microscope, "for the use of the consulting engineer in charge of the department of rails, ties and structural steel." The Yale bequest is said in the will to be in memory of Dr. Dudley's great-grandfather, William Leete, and his wife's great-grandfather, Robert Treat. It is intended to aid further in the establishment on a permanent basis of "the Dudley Chair, Service of Railroads," provided by Lucy B. Dudley.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1924

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income.	Net op. income 1923.
						Maintenance of										
			Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Akron, Canton & Youngstown	Jan.	170	$197,062	$785	$206,417	$24,327	$21,555	$7,628	$62,946	$8,798	$125,254	60.70	$81,163	$66,757	$39,819	$33,281
Alabama & Vicksburg	Jan.	141	194,767	67,057	281,307	64,656	53,407	9,573	111,876	15,032	256,706	91.30	24,601	6,487	10,729	79,160
Vicksburg, Shreveport & Pacific	Jan.	188	222,197	96,364	344,631	72,044	77,451	12,256	130,298	14,748	309,458	89.80	35,173	13,985	—7,325	66,984
Ann Arbor	Jan.	293	341,870	38,602	396,140	37,784	84,650	8,741	211,966	14,518	357,720	90.30	38,420	17,110	—16,625	—3,855
Atchison, Topeka & Santa Fe	Jan.	8,996	9,174,222	3,962,345	14,526,365	1,669,604	4,347,405	309,391	5,255,071	363.701	11,686,131	80.40	2,840,234	1,693,743	1,825,465	3,964,563
Gulf, Colorado & Santa Fe	Jan.	1,908	1,618,854	348.684	2,083,597	390,532	563,886	47,987	685,217	64,148	1,751,283	84.10	332,314	246,499	155,552	295,885
Panhandle & Santa Fe	Jan.	858	626,035	139,196	806,664	57,586	213,254	7,910	217,856	19,550	516,053	64.00	290,611	264,264	229,466	68,471
Atlanta & West Point	Jan.	93	140,932	78,259	247,770	34,327	48,970	6,975	91,712	10,732	197, 60	79.80	50,010	34,910	24,192	16,480
Western of Alabama	Jan.	133	159,108	74,902	258,945	31,071	58,835	9,421	82,659	10,650	197,107	76.10	61,838	47,973	45,621	36,687
Atlanta, Birmingham & Atlantic	Jan.	639	302.582	46,050	374,912	71,969	86,082	22,887	171.777	15,561	368,358	94.20	6,553	—6,240	—20,861	—24,102
Atlantic Coast Line	Jan.	4,868	4,779,401	2,036,699	7,366,892	795,679	1,380,011	135,557	2,545,656	149,572	5,049,007	68.50	2,317,885	1,964,945	1,851,223	1,920,391
Charleston & Western Carolina	Jan.	342	244,852	35,005	293 539	53,241	45,863	7,421	135,196	6,596	253,317	86.30	40,222	22,671	13,933	71,883
Baltimore & Ohio	Jan.	5,303	14,948,652	2,411,968	18,499,738	2,500,292	4,681,610	350,051	7,680,846	550,357	15,279,276	86.10	2,570,462	1,692.840	1,474,461	3,609,494
Baltimore & Ohio Chicago Term	Jan.	83	.....	.....	281,290	31,306	52,755	1,621	188,884	10,251	290.168	103.10	—8,878	—49,356	4,013	48,863
Staten Island Rapid Transit	Jan.	23	88,240	91,652	198,013	26,238	29.323	2,392	121,784	15,929	195,666	98.80	2,347	—15,259	—27,105	—59,426
Bangor & Aroostook	Jan.	616	538,660	73,613	637.924	116,586	149,392	3,629	198,649	21,055	499, 98	76.80	147.626	104.790	140.191	47,745
Belt Ry. of Chicago	Jan.	32	.....	.....	557,441	33 734	79,584	2,518	290,135	12,892	418,863	75.10	138,578	102,999	136,155	173,394
Bessemer & Lake Erie	Jan.	228	750,153	24,317	795,764	73,224	476,605	13,430	316.386	30,546	901,993	113.30	—106,229	—148,736	—56.825	535,592
Bingham & Garfield	Jan.	34	34,955	.....	36.485	6.048	10,450	1,600	10.150	3,697	32,384	88.80	4.101	—5,879	10,397	17,529
Boston & Maine	Jan.	2,287	3.745,107	1,774 579	6.315.674	863,004	1,499,660	55,465	3.101.362	237,942	5.779.748	91.50	535,926	296,561	92,028	—1,499,090
Brooklyn Eastern District Term	Jan.	9	105,833	.....	112.866	10,625	9.458	602	42.397	5,502	68,584	60.80	44,282	37,880	38,160	59,531
Buffalo & Susquehanna	Jan.	253	209,948	5,617	218,643	33,686	87,026	1,977	69,422	9.219	201,330	92.10	17,313	6,813	46,449	78,591
Buffalo, Rochester & Pittsburgh	Jan.	591	1,245,763	143,991	1,438,679	175 909	509,550	25,079	598,756	40,432	1,350,185	93.80	88,494	53.356	144,716	301,302
Canadian Pacific, Lines in Maine	Jan.	233	261,743	40,108	321.371	23,991	50,755	4,752	136,303	3,608	219,409	68.30	101.962	90.962	76,495	52,317
Carolina, Clinchfield & Ohio	Jan.	309	628,814	40,129	681,176	72,587	178,362	26,365	199,758	20,046	497,019	73.00	184,157	134,130	184,258	201,692
Central of Georgia	Jan.	1,920	1,406 251	498,968	2,090,165	269,915	398,786	70,361	859.748	95,852	1.703,727	81.50	386,438	288,877	297.297	325,416
Central of New Jersey	Jan.	693	3,442,460	670,975	4,352,088	494,732	1,502,394	37,141	1,903,036	109,382	4,065,741	93.40	286.347	—177,292	—209,608	89.247
Central Vermont	Jan.	433	485,200	106,500	653.268	92.584	108,593	12,355	319,576	28.499	563.107	86.20	90,161	72,120	45,203	—159,644
Chesapeake & Ohio	Jan.	2,552	6,809,655	855.171	8,037,518	1,026,338	2,134,310	93,629	2.839,294	198,465	6,322,145	78.70	1,715,373	1,340,233	1,482.138	1,374,520
Chicago & Alton	Jan.	1,050	1,875,873	527.032	2,722,438	224,298	670,848	60 360	1,096.597	67,123	2.101.765	77.20	620,673	535,922	428,413	484,916
Chicago & Eastern Illinois	Jan.	945	1,969 875	429.885	2,371,632	274,424	699,524	46,427	1,069,651	68,616	2.172,557	84 50	399,075	287,997	265.925	433,770
Chicago & North Western	Jan.	8,462	7,580.053	2,615,066	11.516,292	1.153,825	2,476.841	146,855	5 658,601	358,022	9,872.909	85.70	1,643,383	881,933	606,867	756,961
Chicago, Burlington & Quincy	Jan.	9,405	9,360,783	2,209.208	13,026,666	1,050,623	3,316.169	249,126	5,518.305	390,999	10,657,859	81.80	2,368,807	1,570,195	1,341.591	2,882,887
Chicago Great Western	Jan.	1,496	1,321,754	365.237	1,842,035	185.093	412,482	60,748	949,088	56,617	1,673,412	90.50	168 623	90,756	11,911	175,471
Chicago, Indianapolis & Louisville	Jan.	654	984,047	237.608	1.351,053	135,407	322,935	32.181	544,560	34,333	1,093,492	80.20	267,561	204,709	84,155	165,988
Chicago, Milwaukee & St. Paul	Jan	10,990	9,012,682	1,972,841	12.394,833	1,230,850	3,178,661	185,067	5,660,674	341.005	10.658,111	86.00	1,736.722	979,228	627,513	1,824,419
Chicago, Peoria & St. Louis	Jan.	247	84,462	12,712	108,729	12,647	19,867	1,937	64.602	8,477	107,520	98.90	1.199	—2.328	—23,054	—25.733
Chicago River & Indiana	Jan.	19	.....	.....	621,006	49.259	57.723	836	255.138	11.889	374,845	60.30	246,161	205.556	308.517	290,025
Chicago, Rock Island & Pacific	Jan.	7,635	6.494.295	2,173,161	9,378,936	942.521	1,924.562	192,949	4,483,796	328,071	7,853 6 4	83.70	1.525.262	1,077.127	537,854	817,675
Chicago, Rock Island & Gulf	Jan.	461	385 847	88,164	515,329	52 600	79,064	12,920	216,357	16.685	379,091	73.60	136,238	123.582	67,029	47.209
Chic., St. P., Minneapolis & Omaha	Jan.	1,749	1,507,315	539,971	2,236,061	212 041	503.602	35,574	1,103,085	73,132	1,933,999	86.50	302,062	175,841	104.591	335,498
Cincinnati, Indianapolis & Western	Jan.	317	299,043	32.678	356,524	27,589	79,941	11.782	154.576	18,051	297,795	82.10	63,729	43,497	30,154	15,467
Colorado & Southern	Jan.	1,099	890,443	146,515	1,114,362	78,136	288,094	10,156	447,264	43,154	894,726	80 30	219.636	156.477	143,870	32.352
Ft. Worth & Denver City	Jan.	456	670,401	175,347	882,150	64,646	166,125	9.456	274.924	39.635	556,660	63.10	325.490	288,299	317.458	166,107
Wichita Valley	Jan.	271	143,182	28,853	179,743	25,558	10,602	35	56.004	1,912	94,111	52.40	85,632	78,699	57,562	9,662
Columbus & Greenville	Jan.	167	83,936	33,751	125.452	37,323	18,432	2,397	47,996	10,269	116,288	92.70	9,164	7,663	—2,387	11,142
Delaware & Hudson	Jan.	894	2,979,416	302.660	3,469,878	494.441	1.127 281	45.385	1,545,804	144,736	3,370,847	97.10	99.031	—3,670	34.867	—400,837
Delaware, Lackawanna & Western	Jan.	993	5.088,150	1,109,670	6,992.984	588,699	1,629.311	127,867	3,039,333	169,654	5.607,182	80.20	1.385,802	898.283	914,166	263,764
Denver & Rio Grande Western	Jan.	2,598	2,011,239	368,351	2,551.755	256,912	762,107	52,250	1,018.523	90,936	2,204,566	86 40	346,889	178,803	207,590	—21,775
Denver & Salt Lake	Jan.	225	141,633	19,343	184,569	36,333	100,519	1,084	81,289	6.587	225,812	122.40	—41,243	—50.243	—45.021	—48,284
Detroit & Mackinac	Jan.	375	84,175	33,450	127,587	19,474	38,139	1,836	63,762	5,204	128,381	100 60	—794	—10.430	—2,279	—6,171
Detroit & Toledo Shore Line	Jan.	61	304,502	.....	309 757	29 204	36.196	3,801	114,812	7,304	191.017	61.60	118,740	93.740	—5,230	80,101
Detroit, Toledo & Ironton	Jan.	468	968.017	8,854	989.229	93,209	156.438	7,260	294,862	24,270	575,812	58.20	413.417	397,696	276,105	69,295
Duluth & Iron Range	Jan.	280	111.097	19,655	148,217	56,433	133,481	863	150.021	22,866	364,197	245.70	—215.980	—224.279	—236.023	—194,115
Detroit, Toledo & Ironton	Jan.	468	968,017	8.854	119.156	139.461	201,544	2,975	143,118	18,465	506,281	424.90	—387.125	—498,842	—496.909	—439,759
Duluth, South Shore & Atlantic	Jan.	591	288,291	119,774	443.219	49.673	86,630	4,710	213,770	10,278	370.539	83.60	72.671	44.592	21,111	10.193
Duluth, Winnipeg & Pacific	Jan.	178	177,157	26,131	210,259	24,810	31,017	2,581	91.052	7,881	157,353	74.80	52,906	42,393	38,886	36,826
Elgin, Joliet & Eastern	Jan.	459	1,773.881	90	1,965,130	145,910	566,584	12,197	724,995	40,957	1,490,530	75.90	474,600	392,617	214,625	570,232
El Paso & Southwestern	Jan.	1,139	751,081	235,563	1,030,528	183,357	223,359	44.179	305.135	41,752	807.633	78.40	222,895	140.394	111,331	213,867
Erie	Jan.	2,039	6,492,694	1,044,415	8,265,671	878,394	2,482,027	145,760	3,515,608	275,443	7,338,387	88.80	927,284	878,286	853,646	344,361

REVENUES AND EXPENSES OF RAILWAYS

CALENDAR YEAR 1924—CONTINUED

Name of road.		Average mileage operated during period.	Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.
Elgin, Joliet & Eastern	Jan.	459	1,773,881	90	1,565,130	145,910			
El Paso & Southwestern	Jan.	1,139	751,081	235,563	1,030,528	183,357	223,359	44,179	
Erie	Jan.	2,039	6,492,694	1,044,415	8,265,671	878,394	2,482,027	145,760	3,515,608

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1924—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues — Freight.	Operating revenues — Passenger.	Operating revenues — Total (inc. misc.)	Operating expenses — Maintenance of — Way and structures.	Operating expenses — Maintenance of — Equipment.	Operating expenses — Traffic.	Operating expenses — Transportation.	Operating expenses — General.	Operating expenses — Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income.	Net op. income 1923.
Chicago & Erie	Jan.	269	$938,102	$58,463	$1,118,191	$100,306	$168,101	$22,615	$441,444	$36,195	$768,713	68.70	$349,478	$296,732	—$24,303	—$199,454
New Jersey & New York	Jan.	45	22,063	97,926	125,417	15,399	20,829	1,058	72,477	3,434	113,197	90.30	12,220	8,553	—19,871	—31,133
New York, Susquehanna & West'n	Jan.	135	270,907	58,111	376,815	54,085	80,229	3,810	232,478	10,477	381,079	101.10	—4,264	—33,431	—42,184	—42,858
Evansville, Indianap. & Terre Haute	Jan.	137	170,426	6,328	183,202	29,226	14,935	1,589	77,539	2,980	126,131	68.80	57,071	52,821	16,562	4,235
Florida East Coast	Jan.	763	956,317	638,163	1,804,144	227,801	274,729	28,150	628,691	35,529	1,214,728	67.30	589,416	491,581	407,729	466,524
Fort Smith & Western	Jan.	249	103,627	22,359	136,592	34,896	32,247	5,013	54,338	8,273	135,562	99.20	1,030	—5,471	—17,010	10,985
Galveston Wharf	Jan.	13	....	....	128,099	44,439	3,830	815	31,715	3,117	88,837	69.40	39,262	22,262	22,584	26,602
Georgia	Jan.	328	339,483	102,534	474,657	43,431	99,065	21,252	217,155	21,801	402,255	84.70	72,402	65,559	70,879	46,046
Georgia & Florida	Jan.	406	113,413	19,087	141,533	17,547	21,509	7,751	57,884	7,702	112,613	79.60	28,920	22,403	10,691	14,811
Grand Trunk Western	Jan.	347	1,133,965	194,374	1,415,585	96,531	403,921	40,390	641,486	50,811	1,240,640	87.60	174,945	109,139	—52,222	—13,262
Atlantic & St. Lawrence	Jan.	166	189,714	34,124	239,938	31,296	52,619	6,127	186,658	15,757	274,375	114.30	—34,437	—49,587	—121,775	—166,660
Chic., Det. & Canada Gr. Tr. Jct.	Jan.	59	219,150	8,880	258,953	11,276	10,448	5,312	89,471	3,394	119,900	46.30	139,053	130,801	108,415	75,740
Det., Grand Haven & Milwaukee	Jan.	189	438,565	39,002	522,443	44,265	46,208	12,553	266,268	15,747	385,423	73.80	137,020	131,501	54,179	—28,754
Great Northern	Jan.	8,251	4,809,953	1,103,350	6,649,601	702,817	1,220,857	150,775	3,224,039	221,432	5,554,567	83.50	1,095,034	433,847	552,038	917,208
Green Bay & Western	Jan.	234	99,376	18,825	125,043	16,417	23,685	3,464	50,777	2,540	96,867	77.40	28,176	20,676	14,577	13,593
Gulf Coast Lines	Jan.	922	757,995	192,408	1,005,954	182,267	124,876	26,325	275,599	35,102	644,159	64.00	361,795	307,384	261,259	14,940
Gulf & Ship Island	Jan.	307	218,463	40,994	289,162	44,862	38,378	7,665	85,194	14,666	201,884	69.80	87,278	60,075	49,060	44,433
Gulf, Mobile & Northern	Jan.	465	424,289	44,559	487,982	80,203	77,524	21,545	169,498	17,885	365,502	74.90	122,480	97,219	84,075	97,343
Hocking Valley	Jan.	348	1,075,638	84,909	1,232,778	117,149	364,518	13,540	425,597	35,299	956,027	77.60	276,751	183,806	245,798	178,162
Illinois Central	Jan.	4,845	10,129,596	2,397,806	13,338,343	1,510,410	2,821,984	218,415	5,432,149	339,830	10,356,754	77.60	2,981,589	2,092,439	2,221,058	2,537,351
Yazoo & Mississippi Valley	Jan.	1,380	1,334,676	358,110	1,772,884	248,834	288,463	24,569	728,428	47,569	1,330,106	75.00	442,778	327,350	318,305	342,182
Illinois Central Combined Report	Jan.	6,225	11,464,272	2,755,916	15,111,227	1,759,244	3,110,447	242,984	6,160,577	387,399	11,686,860	77.30	3,424,367	2,419,789	2,539,363	2,879,533
International-Great Northern	Jan.	1,159	983,295	215,985	1,317,685	246,650	249,696	34,691	549,374	51,956	1,123,396	85.25	194,289	159,501	96,017	100,471
Kansas City, Mexico & Orient	Jan.	272	135,382	7,381	147,322	32,425	36,891	5,793	73,650	7,166	155,925	105.80	—8,603	—14,659	—30,042	—30,816
Kansas City, Mex. & Orient of Tex.	Jan.	465	155,230	11,943	174,332	31,468	31,052	5,534	73,019	5,239	146,293	83.90	28,039	24,003	9,730	—41,402
Kansas City Southern	Jan.	767	1,217,259	173,491	1,502,612	201,492	269,845	40,743	524,071	70,631	1,103,307	73.40	399,305	305,765	286,206	348,980
Texarkana & Fort Smith	Jan.	95	191,105	15,516	225,244	8,628	28,885	4,331	59,438	9,508	110,790	49.20	114,454	98,813	67,961	75,782
Kansas, Oklahoma & Gulf	Jan.	314	174,483	11,658	192,481	46,570	26,889	8,450	78,302	12,554	172,855	89.80	19,626	9,150	—5,049	25,457
Lake Superior & Ishpeming R. R.	Jan.	163	62,889	5,738	71,565	29,254	33,985	507	37,406	5,316	106,468	148.80	—34,903	—45,152	—47,428	—40,633
Lake Terminal	Jan.	13	....	....	71,438	16,514	16,484	....	55,037	1,955	89,990	126.00	—18,552	—24,957	—28,810	1,197
Lehigh & Hudson River	Jan.	96	239,946	2,845	253,456	35,083	51,525	1,390	99,647	15,163	202,808	80.00	50,648	36,223	12,741	39,835
Lehigh & New England	Jan.	219	412,087	1,684	426,364	63,774	114,218	5,953	146,055	16,198	346,198	81.20	80,166	65,384	79,770	69,876
Lehigh Valley	Jan.	1,374	5,033,749	554,352	5,971,120	758,247	1,662,668	101,733	2,681,785	138,363	5,366,312	89.90	604,808	369,990	265,510	—929,033
Los Angeles & Salt Lake	Jan.	1,209	1,353,767	500,302	2,019,692	382,369	455,006	58,817	725,500	58,260	1,733,805	85.80	285,887	156,833	90,602	67,964
Louisiana & Arkansas	Jan.	302	271,160	38,849	317,560	56,115	64,731	8,181	88,530	9,306	226,771	71.40	90,789	64,467	55,857	99,374
Louisiana Ry. & Nav. Co.	Jan.	343	251,241	26,673	297,853	76,981	47,577	10,296	133,761	11,120	279,710	93.90	18,143	125	—22,975	24,318
Louisiana Ry. & Nav. of Texas	Jan.	206	89,559	15,312	113,821	21,259	19,047	3,427	56,334	4,666	104,733	92.00	9,088	5,088	—12,809	Not avail'le
Louisville & Nashville	Jan.	5,042	7,861,429	2,128,385	10,712,529	1,548,547	2,896,365	269,363	4,550,338	259,016	9,567,814	89.30	1,144,715	743,920	820,742	1,726,743
Louisville, Henderson & St. Louis	Jan.	199	215,595	59,636	291,752	40,814	46,803	6,419	100,017	9,506	203,559	69.80	88,193	79,271	67,775	70,194
Maine Central	Jan.	1,204	1,141,088	343,954	1,608,119	241,979	361,368	13,382	777,910	51,319	1,445,881	89.90	162,238	59,987	51,079	—184,190
Midland Valley	Jan.	365	313,815	60,096	384,314	49,879	49,036	5,586	118,605	18,528	239,612	62.30	144,702	128,430	122,993	103,347
Minneapolis & St. Louis	Jan.	1,649	988,228	150,313	1,202,219	138,063	275,196	25,488	651,972	42,691	1,133,561	94.30	68,658	—1,403	—84,169	184,223
Minneapolis, St. Paul & S. S. Marie	Jan.	4,402	2,294,737	620,943	3,168,102	454,207	609,619	61,435	1,640,573	119,606	2,896,668	91.40	271,434	30,345	7,659	625,718
Mississippi Central	Jan.	258	132,727	17,931	155,288	27,783	26,279	5,695	46,831	8,424	114,998	74.10	40,290	33,790	37,543	52,044
Missouri & North Arkansas	Jan.	364	93,971	20,780	122,564	24,221	26,433	4,892	60,223	7,310	123,079	100.40	—515	—3,681	—9,707	—5,677
Missouri-Kansas-Texas	Jan.	1,813	1,920,222	489,018	2,611,751	305,511	706,902	51,640	783,151	100,027	1,959,333	75.00	652,418	486,653	557,891	546,749
Missouri-Kansas-Texas of Texas	Jan.	1,389	1,098,165	445,787	1,686,888	250,186	210,518	41,068	727,762	64,658	1,295,360	76.80	391,528	336,440	130,260	—177,953
Missouri Pacific	Jan.	7,364	7,074,126	1,506,040	9,539,608	1,155,231	2,148,824	191,214	4,089,688	314,191	7,966,736	83.50	1,572,872	1,195,312	931,018	599,544
Mobile & Ohio	Jan.	1,165	1,354,258	173,850	1,618,591	221,237	315,497	45,360	601,344	48,266	1,231,799	76.10	386,792	307,964	240,234	329,258
Monongahela	Jan.	106	447,294	29,031	480,272	55,000	85,793	1,151	151,700	9,234	302,403	63.00	177,869	167,327	83,716	56,017
Monongahela Connecting	Jan.	7	....	....	192,944	22,257	41,203	375	99,497	4,858	168,190	87.20	24,754	19,707	9,977	—9,619
Montour	Jan.	57	130,544	1,067	133,217	24,696	43,425	1,014	42,519	7,378	119,032	89.40	14,185	7,958	37,141	60,801
Nashville, Chattanooga & St. Louis	Jan.	1,258	1,324,147	435,809	1,892,610	275,977	500,979	83,401	802,501	72,802	1,741,683	92.00	150,927	90,818	108,171	231,015
Nevada Northern	Jan.	165	64,719	9,961	79,403	12,489	7,206	891	17,034	4,519	42,139	53.00	37,264	30,341	29,781	16,721
Newburgh & South Shore	Jan.	7	....	....	153,541	15,786	53,418	....	74,651	3,778	148,432	97.60	5,109	—8,158	3,296	—20,153
New Orleans Great Northern	Jan.	274	196,416	27,997	232,430	27,058	44,259	5,404	77,336	11,795	166,354	71.60	66,076	49,353	42,739	65,053
New York Central	Jan.	6,889	18,193,292	7,861,422	29,735,596	3,177,432	6,720,492	381,907	11,966,544	891,624	23,334,653	79.10	6,200,943	4,380,681	4,145,558	4,735,140
Cincinnati Northern	Jan.	244	337,758	12,483	356,058	52,007	76,276	4,891	125,430	7,393	266,080	74.70	89,978	72,762	38,851	80,130
Cleve., Cincinnati, Chic. & St. L.	Jan.	2,407	5,082,092	1,416,832	7,120,149	735,526	175,291	104,951	2,033,472	205,798	5,885,362	82.70	1,234,787	905,255	667,092	1,632,252
Indiana Harbor Belt	Jan.	119	....	....	830,125	85,984	100,329	4,324	470,210	23,662	683,808	82.40	146,317	124,896	6,645	112,392
Michigan Central	Jan.	1,862	4,659,897	1,753,012	7,092,669	711,982	1,524,150	87,836	2,746,406	154,168	5,299,060	74.70	1,793,609	1,403,870	1,360,611	2,020,027
Pittsburgh & Lake Erie	Jan.	234	2,647,808	258,743	3,008,561	336,126	969,386	22,683	1,027,840	71,176	2,428,349	80.70	580,212	402,780	762,046	1,282,758
New York, Chicago & St. Louis	Jan.	1,696	4,077,444	151,784	4,369,904	557,119	881,376	120,742	1,880,756	162,595	3,603,431	82.50	766,473	517,720	398,488	751,945
New York, New Haven & Hartford	Jan.	2,000	4,957,971	3,881,846	10,021,174	1,129,123	2,384,340	61,217	4,115,942	303,596	8,168,457	81.50	1,852,717	1,437,042	1,090,107	—780,587
Central New England	Jan.	295	623,479	13,987	659,143	95,124	118,703	4,943	236,416	10,922	466,108	70.70	193,035	167,287	120,283	—145,822
New York Connecting	Jan.	19	175,082	....	228,323	8,933	16,133	....	41,879	1,276	68,221	29.90	160,102	120,102	84,129	—47,602
New York, Ontario & Western	Jan.	569	641,862	100,024	889,912	125,409	242,413	16,259	484,408	42,413	911,877	102.50	—21,965	—70,032	—101,733	—208,616
Norfolk & Western	Jan.	2,240	6,445,888	763,047	7,510,543	1,079,081	2,033,529	85,286	2,738,653	163,253	6,117,390	81.50	1,393,153	818,121	946,063	592,835

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1924—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net operating income.	Net operating income 1923.
Norfolk Southern	Jan.	931	$577,812	$112,631	$734,672	$110,748	$115,177	$25,994	$311,347	$28,833	$592,633	80.70	$142,039	$98,703	$73,376	$39,524
Northern Pacific	Jan.	6,669	4,829,316	1,125,116	6,606,148	677,956	1,568,767	139,461	3,004,655	234,992	5,662,822	85.70	943,326	261,151	509,420	1,021,272
Northwestern Pacific	Jan.	496	266,903	156,923	474,637	133,656	103,534	4,612	222,069	18,283	482,079	101.60	—7,442	—53,537	—61,421	—22,442
Pennsylvania	Jan.	10,484	33,973,207	12,406,940	50,667,393	4,833,358	12,939,799	641,765	21,565,558	1,428,499	42,209,035	83.30	8,458,358	6,549,605	5,116,551	4,944,481
Baltimore, Chesapeake & Atlantic	Jan.	87	60,381	22,461	85,441	9,792	16,376	1,594	72,217	3,530	103,509	121.10	—18,068	—18,068	—20,452	—14,738
Long Island	Jan.	397	706,878	1,392,488	2,299,315	311,356	488,710	18,320	1,213,431	65,551	2,112,333	91.90	186,982	136,589	92,771	25,900
Maryland, Delaware & Virginia	Jan.	52	7,366	3,991	12,277	3,227	4,382	708	14,806	529	23,652	192.60	—11,375	—11,375	—14,136	—44,252
West Jersey & Seashore	Jan.	359	296,878	409,686	773,737	126,499	169,616	11,251	471,243	22,459	815,542	105.40	—41,805	—42,009	—64,698	11,213
Peoria & Pekin Union	Jan.	19	23,362	2,777	160,875	9,371	15,132	559	81,729	8,015	114,806	71.40	46,069	33,569	55,022	82,655
Pere Marquette	Jan.	2,292	2,349,876	437,517	3,096,779	323,344	753,017	62,342	1,377,536	104,944	2,623,690	84.70	473,089	323,545	226,775	545,274
Philadelphia & Reading	Jan.	1,125	6,422,009	874,325	7,632,619	817,214	2,073,008	71,424	3,072,988	248,717	6,301,140	82.60	1,331,479	961,746	1,110,826	2,611,598
Atlantic City	Jan.	170	93,126	118,928	226,588	102,437	32,432	5,551	178,820	4,054	323,303	142.70	—96,715	—116,675	—140,220	—114,085
Perkiomen	Jan.	41	93,603	5,133	102,578	7,958	4,715	107	42,902	836	56,549	55.10	46,029	41,243	38,223	44,800
Port Reading	Jan.	21	136,683	.....	177,861	22,165	7,920	229	86,094	4,415	120,823	67.90	57,038	39,607	—8,608	90,126
Pittsburgh & Shawmut	Jan.	102	88,952	5,927	96,492	16,916	40,746	1,100	34,532	7,463	100,757	104.40	—4,265	—4,404	11,990	45,718
Pittsburgh & West Virginia	Jan.	92	264,501	8,069	303,551	23,482	111,526	4,311	72,621	14,129	236,340	77.90	67,211	29,401	107,175	91,967
Pittsburgh, Shawmut & Northern	Jan	210	82,104	7,226	92,296	20,495	37,610	1,409	53,357	6,268	119,139	129.10	—26,843	—29,631	—31,953	23,697
Quincy, Omaha & Kansas City	Jan.	250	66,426	21,815	96,163	19,966	12,610	962	52,539	2,886	88,847	92.40	7,316	3,265	—2,346	—2,619
Richmond, Fredericksburg & Potomac	Jan.	117	417,916	404,124	993,544	92,400	153,257	10,439	348,672	34,257	660,234	66.50	333,310	276,870	230,416	207,285
Rutland	Jan.	413	273,026	123,433	502,662	85,706	111,130	8,586	234,344	13,713	455,216	90.60	47,446	24,490	34,111	30,535
St. Louis-San Francisco	Jan.	4,751	4,714,489	1,575,719	6,791,901	742,349	1,309,439	91,353	2,572,752	205,044	4,889,944	72.00	1,901,957	1,547,268	1,555,564	1,569,434
Ft. Worth & Rio Grande	Jan.	235	102,816	26,689	139,393	17,915	21,700	4,243	58,442	6,242	108,507	77.80	30,886	27,032	18,756	—9,380
St. Louis, San Francisco & Texas	Jan.	134	126,509	17,172	148,700	19,561	22,772	4,968	53,550	6,182	106,946	71.90	41,754	39,665	16,478	1,911
St. Louis Southwestern	Jan.	969	1,301,038	170,131	1,550,797	167,061	300,443	46,604	435,858	64,303	1,027,654	66.30	523,143	447,592	407,498	561,799
St. Louis Southwestern & Texas	Jan.	807	506,538	104,033	662,805	128,260	219,931	21,825	274,851	38,248	686,503	103.60	—24,098	—49,721	—41,110	—191,883
San Antonio & Aransas Pass	Jan.	739	359,716	78,954	469,531	109,078	123,648	11,294	208,221	22,999	472,304	100.60	—2,773	—20,005	—17,135	—47,700
San Antonio, Uvalde & Gulf	Jan.	317	79,646	23,090	114,680	19,321	16,352	4,701	47,067	6,529	93,970	81.90	20,710	17,415	4,830	—6,915
Seaboard Air Line	Jan.	3,571	3,141,969	1,178,473	4,751,837	691,931	845,315	156,612	1,860,223	171,640	3,780,447	79.60	971,390	780,736	682,301	524,958
Southern Ry	Jan.	6,849	7,609,202	2,790,304	11,342,193	1,537,927	2,277,796	232,920	4,445,144	324,346	8,904,497	78.50	2,437,696	1,952,117	1,751,532	2,196,430
Alabama Great Southern	Jan.	318	584,799	172,330	803,362	118,400	194,355	20,576	280,791	23,879	644,358	80.20	159,004	125,078	139,850	279,857
Cinc., New Orleans & Texas Pac.	Jan.	338	1,259,142	420,767	1,769,666	255,124	410,480	36,831	560,404	42,163	1,315,894	74.40	453,772	390,254	405,261	465,379
Georgia Southern & Florida	Jan.	401	250,499	137,869	420,771	65,835	54,946	9,791	163,436	11,106	368,823	73.40	111,948	91,876	45,087	42,716
New Orleans & Northeastern	Jan.	207	390,973	82,699	503,260	70,459	100,799	11,084	163,621	15,419	365,274	72.60	137,986	100,808	89,070	104,156
Northern Alabama	Jan.	110	114,533	14,882	132,693	4,786	8,970	2,486	37,732	3,425	57,399	43.30	75,294	70,263	47,027	45,971
Southern Pacific	Jan.	7,142	9,330,202	3,545,099	14,245,685	2,256,651	2,891,296	279,021	5,154,485	522,478	11,375,395	79.90	2,870,290	1,656,102	1,568,304	2,016,607
Arizona Eastern	Jan.	382	258,994	29,255	303,551	54,450	43,949	3,154	85,168	20,606	208,724	68.80	94,827	68,042	58,984	89,144
Atlantic Steamship Lines	Jan.	.....	863,940	47,283	975,798	33,257	148,803	23,832	710,221	30,395	946,508	97.00	29,290	17,466	17,336	195,339
Galveston, Harrisburg & S. Antonio	Jan.	1,379	1,490,537	456,749	2,060,408	418,777	503,905	47,485	786,970	77,054	1,848,102	89.70	212,306	148,426	100,418	122,315
Houston & Texas Central	Jan.	923	846,346	258,527	1,177,603	271,330	269,158	23,555	439,676	48,961	1,052,299	89.40	125,304	65,476	15,573	192,068
Houston, East & West Texas	Jan.	191	196,933	41,790	251,547	81,844	65,673	3,644	113,065	9,735	270,752	107.60	—19,205	—27,772	—39,012	4,751
Louisiana Western	Jan.	207	274,214	94,981	392,306	49,821	74,420	13,532	115,427	17,582	274,490	70.00	117,816	89,299	90,917	118,198
Morgan's L. & T. R. R. & S. S. Co.	Jan.	400	500,440	155,414	708,938	135,382	199,809	21,342	305,958	40,518	706,482	99.70	2,456	—45,837	—65,376	100,171
Texas & New Orleans	Jan.	507	532,417	167,960	751,648	261,767	215,064	14,337	294,828	31,068	823,307	109.50	—71,659	—100,740	—138,029	—32,265
Spokane International	Jan.	165	67,063	16,660	88,636	10,147	7,339	3,496	36,037	5,364	63,183	71.30	25,453	19,656	14,007	18,631
Spokane, Portland & Seattle	Jan.	554	468,027	124,799	660,403	56,001	131,524	9,943	201,861	17,722	424,542	64.30	235,861	162,741	99,659	119,049
Tennessee Central	Jan.	287	157,683	39,650	210,885	33,995	36,928	6,847	90,499	10,017	178,151	84.50	32,734	26,516	11,645	21,049
Term. R. R. Assoc. of St. Louis	Jan.	37	.....	.....	426,659	103,333	47,557	1,038	181,850	8,571	345,876	81.10	80,783	17,098	124,358	174,086
East St. Louis Connecting	Jan.	1	.....	.....	225,333	15,374	17,329	298	89,133	2,396	124,530	55.30	100,803	90,112	66,155	69,254
St. Louis, Merchants Bridge Term.	Jan.	9	.....	.....	450,344	68,101	39,628	961	224,265	7,128	340,083	75.50	110,261	82,120	74,194	82,206
St. Louis Transfer Ry.	Jan.	6	.....	.....	87,069	8,449	9,685	173	53,499	1,301	73,107	84.00	13,962	13,552	4,228	12,373
Texas & Pacific Ry.	Jan.	1,952	1,907,760	635,716	2,730,633	515,790	414,205	59,358	976,186	89,802	2,079,252	76.10	651,381	509,300	394,046	—12,138
Toledo, Peoria & Western	Jan.	247	88,027	43,331	143,053	20,144	41,906	2,160	77,573	7,077	148,859	104.10	—5,806	—15,806	—19,994	—22,949
Trinity & Brazos Valley	Jan.	368	146,393	239,985	177,941	62,395	60,689	3,200	95,935	12,316	233,968	131.50	—56,027	—63,141	—83,873	—23,185
Ulster & Delaware	Jan.	128	35,818	11,360	78,439	15,015	17,823	1,565	48,485	7,264	90,152	114.90	—11,713	—17,292	—19,173	—16,113
Union R. R. of Penna.	Jan.	45	.....	.....	825,514	67,654	215,488	255	472,629	8,080	764,106	92.60	61,408	50,408	131,076	276,896
Union Pacific	Jan.	3,714	5,922,637	1,293,870	7,917,511	617,496	1,644,972	135,343	2,580,102	284,663	5,405,862	68.30	2,511,649	1,853,636	1,846,599	1,610,048
Oregon Short Line	Jan.	2,365	2,239,794	383,908	2,816,252	310,301	553,027	41,589	1,004,565	112,198	2,067,851	73.40	748,401	470,045	446,204	538,363
Oregon Wash. R. R. & Nav. Co.	Jan.	2,231	1,716,886	409,963	2,319,035	290,491	381,910	62,473	940,276	120,261	1,824,637	78.70	494,398	325,768	261,364	—100,174
St. Joseph & Grand Island	Jan.	258	226,047	24,550	264,992	36,629	49,306	2,970	115,356	12,490	217,431	82.00	47,561	34,244	24,076	17,122
Utah	Jan.	102	184,371	509	185,299	21,102	44,516	413	43,995	10,131	120,157	64.80	65,142	54,951	44,454	26,287
Virginian	Jan.	544	1,378,411	71,722	1,537,149	106,656	353,848	12,982	493,327	18,846	983,755	64.00	553,394	406,980	405,978	444,950
Wabash	Jan.	2,486	3,836,429	778,252	5,002,363	636,728	915,882	138,645	2,306,463	172,205	4,196,229	83.90	806,134	585,623	335,545	335,545
Western Maryland	Jan.	804	1,543,117	67,707	1,680,210	207,795	357,171	35,970	578,117	47,665	1,258,337	75.20	441,873	351,873	324,248	319,116
Western Pacific	Jan.	1,042	738,470	128,707	932,581	128,526	201,361	33,727	327,135	34,459	791,750	84.90	140,831	52,569	113,809	77,195
Wheeling & Lake Erie	Jan	511	1,360,235	58,601	1,496,921	147,574	406,757	23,390	555,120	34,038	1,169,064	78.10	327,857	215,307	204,223	—62,779

Protective Section, A. R. A.

The fourth annual meeting of the Protective Section of the American Railway Association will be held at the Brown Palace Hotel, Denver, Colo., on Wednesday, Thursday and Friday, July 9, 10 and 11. Reservations should be made direct with the hotel management at as early a date as possible. A room with bath for one person, European plan, will be five dollars a day; for two persons, eight dollars a day. All rooms are outside rooms. J. C. Caviston, secretary, 30 Vesey street, New York, announces that a supplementary notice, with advance copies of committee reports, will be forwarded to the members at a later date.

Columbus, Ohio, in Eastern Time Zone

The Interstate Commerce Commission has issued its tenth supplemental report, by Commissioner Aitchison, modifying its previous orders defining the limits of the United States standard Eastern and Central time zones so as to include the city of Columbus and other portions of the state of Ohio within, and so as to exclude certain portions of West Virginia from, the first or Eastern time zone. The proceeding was reopened upon the petition of the city of Columbus and the Chamber of Commerce of that city. It is understood that the change will be made on March 30. Wayne County, W. Va., and the portion of the Norfolk & Western, north and west of Williamson, W. Va., are to be in the Central time zone.

Railroad Departments of Chicago Y. M. C. A. Meet

The eighth annual dinner of the members of the boards of management of the railroad departments of the Y. M. C. A. at Chicago was held in the Central Y. M. C. A. building on Friday evening, March 14. Splendid reports of progress during the year were made by the following departments: Chicago & Eastern Illinois; Chicago & North Western; Dearborn station; Grand Trunk; Illinois Central and Pennsylvania lines. H. R. Safford, vice-president of the Chicago, Burlington & Quincy, presided as toastmaster, and addresses were made by H. E. Ewing, international secretary of the Y. M. C. A., South America; C. R. Bearmore, general railroad Y. M. C. A. secretary, Chicago; W. J. Parker, general secretary of the Chicago Y. M. C. A.; and Roy V. Wright, managing editor, *Railway Age*.

Defective Locomotives in February

The number of locomotives inspected by the Bureau of Locomotive Inspection of the Interstate Commerce Commission during February was 5,631, according to the commission's monthly report to Congress on the condition of railroad equipment. Of these 3,064 were found defective and 577 were ordered out of service. The number of accidents caused by the failure of some part or appurtenance of the locomotive or tender was 92, in which 11 were killed and 99 injured. During the same month 87,965 freight cars were inspected, of which 3.8 per cent were found defective, and 1,481 passenger cars, of which 11 or .7 per cent were found defective. Fifteen cases involving 28 violations of the safety appliance acts were transmitted to various United States attorneys for prosecution.

Central of Georgia Feels Encouraged

President L. A. Downs, in his latest manifesto in the newspapers says that the Central of Georgia believes that the railways of the United States are in the best condition in their history, both physically and in the place they today occupy in public opinion. The public is displaying a spirit of fair play and of appreciation of transportation's achievements that is most encouraging. Continuing, he says:

"The spirit is manifested in many ways; by the voice of the press, by utterances on public occasions, by the correspondence of shippers with carriers, by resolutions of civic organizations in support of a sound public policy toward the railroads. All of these indicate a better understanding of transportation affairs. Informed public opinion seems definitely to have crystalized in favor of private initiative and competition under reasonable regulation. The only exception to this prevailing sentiment seems to be on the part of those radicals who are advocating an impossible program of rate-reduction coupled with wage increases. * * * The Central of Georgia does not believe that the farmers, the business men, the shipping and traveling public generally, favor the radical program that has as its first step the confiscation of invested property, then government ownership of railways, and finally the establishment of some form of Socialistic government in America. We believe that the people favor a policy that will permit the railways to expand and thus keep pace with the development of the country.

"We consider it our obligation to seek in every proper way to enlist public interest in the future of the railways. * * * Constructive criticism and suggestions are invited."

Messages by Radio on the D. T. & I.

The Detroit, Toledo & Ironton has three radio stations—Dearborn, Mich (KDEN), Springfield, Ohio (WNA), and Jackson, Ohio (WJQ); and the station at Dearborn sends 400 messages a day to Springfield and Jackson. Springfield is 200 miles distant and Jackson is 300 miles. Preparations are being made to increase the capacity of the station to 2,000 messages a day (8 hours). Between Dearborn and the factories of the Ford Motor Company at River Rouge, a printing telegraph system is employed.

The station at Dearborn has three towers, each 165 ft. high, and the antennæ are 360 ft. long and consist of five wires each. The wave lengths are 1,713 at Dearborn, 1,875 at Springfield and 1,934 at Jackson.

C. N. R. Earns $20,236,563 in 1923

Final figures showing a complete statement of operating results on the Canadian National Railways during the calendar year of 1923 show that the net earnings last year were $20,236,563.09, as compared with $2,886,711.55 in 1922, or a net increase of $17,349,851.54.

	1923	1922
Operating revenues	$254,926,456.04	$234,059,025.05
Operating expenses	234,689,892.95	231,172,313.50
Net revenues	$20,236,563.09	$2,886,711.55

Complete returns for the month of December last show the net earnings for that month to be $3,633,960.12, as compared with a deficit of $2,885,404.52 in the same month in 1922, showing an improvement of $6,519,364.64. During December last the operating ratio was 84.04 as compared with 113.63 in December, 1922, a decrease of 29.59. During the 12 months of 1923 the operating ratio was 92.06 as compared with 98.77 in the year 1922, a decrease of 6.71.

The December operating figures follow:

	Dec., 1923	Dec., 1922
Gross earnings	$22,767,007.17	$21,172,726.36
Operating expenses	19,133,047.05	24,058,130.88
Net earnings	$3,633,960.12	deficit $2,885,404.52

Highway Crossings in Canada

The Dominion Board of Railway Commissioners has reported on the administration of the Railway Grade Crossing Fund, created in 1919; a fund consisting of $200,000 set aside annually for 10 years (from April 1, 1919) for the purpose of aiding in the construction of protective safety works.

Between April 1, 1919, and the end of last year (four years 9 months), 554 orders providing protection for 614 crossings were issued as follows: for automatic half-interlocking plants, 2; for closing crossings, 23; diversion of highways, 47; diverted highway and bridge, 1; diversion of highway and removal of view obstruction, 1; electric bells, 265; electric bell and flashlight, 1; electric bell and removal of obstruction, 2; electric bell and wig-wag, 62; electric bell, wig-wag and removal of obstruction, 5; easing curve on approach to highway bridge, 1; gates, 118; gates and half-interlocking, 1; overhead bridge, 25; removal of view obstructions, 21; removal of view obstructions and reducing grade, 1; shelter, 1; underpasses, 58; towers, 3; wig-wags, 13. The increase in the number of crossing protections in the calendar year 1923 was 51.

C. N. R. "White Elephant" Turns "Pearl Grey"

At the Canadian Club luncheon in Montreal on March 10 Sir Henry Thornton, president of the Canadian National Railways, stated that the budget of that system this year would ask the Dominion government for $20,000,000 less than last year. "I am advised," said Sir Henry, "that the Dominion

government's budget will be balanced this year. Towards that cheerful work the Canadian National Railways system has played its part. The net earnings of the system last year were $22,200,000 as compared with slightly more than $3,000,000 in 1922. Knowing this I determined that this increase in net earnings should reflect in our budget this year and so I am able to tell you now that the Canadian National Railways will ask the government this year for $20,000,000 less than it asked last year; and while there are still considerable improvements to be made to the system and much work remains to be done you may be comforted by knowing that the 'white elephant' has reduced the color of his hide towards a 'pearl grey' to the extent of $20,000,000. This year we hope to make it $30,000,000."

Good and Bad Conduct Recorded

The "Educational Bulletin" of the Algoma District of the Canadian Pacific for the month of February names ten employees who received merit marks for unusual service; and lists, without giving names, 16 against whom demerits were entered; and three were dismissed. One of the prominent items under the head of demerits was against an engineman for allowing his engine to become frozen in the ice at a water tank, causing delay to a passenger train. Two of the merit items, somewhat unusual, were as follows:

"On train No. 42, Toronto to Montreal, on January 22, an infant in charge of a nurse, became violently ill. As there was no doctor on the train, the crew volunteered their assistance, and Conductor S. Cross, Trainmen W. J. Coulter and C. Minnker, Sleeping Car Conductor D. Allen and Porter E. Ruddick, under the supervision of the nurse, kept up artificial respiration for a considerable time. The assistance rendered, no doubt, saved a life and, needless to say, it was appreciated by the passengers concerned.

"When off duty, Operator P. Wedge, Chapleau Division, discovered a broken wire, two poles east of Mileage 20, White River Subdivision; the wire had slacked off in festoons to a distance of twenty-six poles; in a number of places the wire was either hanging on ground or swung over the other wires. Operator Wedge, with assistance of sectionmen, took up the slack in the wire; in order to do this it was necessary for him to climb twelve poles, when the temperature was 45° below zero; he also had to untie wires before slack could be taken up."

Four other merit items had to do with repairing broken telegraph wires.

Revenues and Expenses for January

The Interstate Commerce Commission's summary of railway revenues and expenses, for Class I roads, for January is as follows:

Item	1924	1923
Avearge number of miles operated	235,928.21	235,778.15
Revenues:		
Freight	$333,576,473	$367,025,807
Passenger	[1]91,730,046	[2]91,136,572
Mail	7,887,194	7,445,644
Express	10,509,631	10,916,188
All other transportation	14,713,659	15,295,761
Incidental	9,685,405	10,074,730
Joint facility—Cr.	1,081,891	843,069
Joint facility—Dr.	207,667	195,872
Railway operating revenues	468,976,632	502,541,899
Expenses:		
Maintenance of way and structures	55,308,385	52,885,419
Maintenance of equipment	110,331,476	123,031,713
Traffic	8,093,550	7,475,313
Transportation	193,729,414	208,485,557
Miscellaneous operations	4,213,007	4,117,308
General	14,381,750	13,539,468
Transportation for investment—Cr.	1,073,196	557,262
Railway operating expenses	384,984,386	408,977,516
Net revenue from railway operations	83,992,246	93,564,383
Railway tax accruals	25,886,171	25,514,302
Uncollectible railway revenues	156,354	99,629
Railway operating income	57,949,721	67,950,452
Equipment rents—Dr. balance	5,107,136	5,416,086
Joint facility rent—Dr. balance	1,561,421	1,405,389
Net railway operating income	51,281,164	61,128,977
Ratio of expenses to revenues (per cent)	82.09	81.38

[1]Includes $2,758,602 sleeping and parlor car surcharge.
[2]Includes $2,786,394 sleeping and parlor car surcharge.

Traffic News

Through train service between Chicago and New York by way of the Grand Trunk and the Lehigh Valley is announced, to begin April 27. Trains will leave each city at noon daily and run through in 28 hours.

The Live Stock Traffic Association, Fort Worth, Texas, filed an application with the Texas Railroad Commission on March 8 for a revision of rates on live stock in Texas. The application will be heard on April 8.

A "Better Cotton" demonstration train is being operated over the lines of the St. Louis-Southwestern in southeastern Missouri, Arkansas, Louisiana and Texas, carrying agricultural specialists with exhibits to be shown to farmers. The tour will cover a period of 15 days.

The Northern Pacific will reduce freight rates on dairy cattle from all eastern terminals to North Dakota, Minnesota and Montana points 25 per cent from April 15 to Sept. 1. The reduction will be in the nature of an experiment to aid farmers in that section to introduce dairying on their farms; and to determine how much advantage could be taken of such a rate.

The Northern Pacific put into effect, on March 4, home-seekers' ticket rates to points in the Northwest. Roundtrip tickets for the one-way fare plus $2 will be sold on the first and third Tuesdays of each month from March to November at ticket offices in St. Paul, Minn., and Minneapolis, Minn., Superior, Wis.; and from points east to points in Minnesota, North Dakota, Montana, Idaho, Washington and Oregon.

The Gulf, Mobile & Northern is co-operating with the American Cotton Association in a campaign for the control of the boll weevil and will take part in the conduct of eight test farms, on which experiments are to be conducted at different points along the line of the road. The farms will be of eight acres each and the interest of local farmers will be enlisted. The Cotton Association will conduct experiments with poison designed to kill the bugs.

Freight traffic on the Missouri Pacific during February exceeded that recorded in February a year ago by 32.5 per cent with a total of 78,247 cars loaded locally along the lines and 32,338 cars received from connections. The average number of miles per car day in February was 30.86 compared with 28.72 in January and 17.82 in February, 1923. A total of 10,249 passenger trains were operated during February, with 93.8 per cent on time compared with 75.6 per cent on time in February, 1923.

The number of spindles in cotton mills of the Southern states today, as reported by the Southern Railway Company, is 16,747,046, or 44.5 per cent of the total in the United States. In 1923 there was a net increase of 782,665 spindles in the South and a net decrease of 92,510 spindles in states outside the South. Southern mills consumed 4,247,748 bales of cotton in 1923, equal to 63.72 per cent of the total consumption in the United States and 1,829,402 bales more than in all states outside the South. In the year 1923 seven dyeing, bleaching and finishing plants were built or begun in southern towns.

The Senate committee on interstate commerce on March 19 voted 10 to 2 to report favorably to the Senate the bill introduced by Senator Gooding to amend the long and short haul provisions of the interstate commerce act in such a way as to remove most of the discretion now allowed the Interstate Commerce Commission to grant relief to the railroads from an absolute prohibition. The committee also voted a favorable report on the bill introduced by Senator Smith in the form recommended by the Interstate Commerce Commission to extend the time allowed to shippers to file claims for overcharges.

A reduction in the rates on livestock on the western roads to the level established by General Order No. 28 of the director general of railroads on June 25, 1918, is asked in a complaint

filed with the Interstate Commerce Commission by the American Livestock Association and various other livestock associations. General Order No. 28 made an increase of 25 per cent with a maximum of 7 cents per hundred pounds and was followed in 1920 by the increases of Ex Parte 74 which advanced the rates in the western territory by 35 per cent and those in the Mountain-Pacific territory by 25 per cent. Later the Interstate Commerce Commission reduced the rates by 20 per cent. The associations ask the removal of the increases since General Order No. 28 on the ground that the prices of livestock have fallen to prewar levels.

Of the 3,588 cars of fruit and vegetables inspected by the Western Inspection Bureau during January at ten of the larger cities in the West, 1,429 cars or 39.8 per cent were found damaged. Damage to 894 cars or 62.6 per cent of those found damaged was due to freezing in transit; in 133 cars or 9.3 per cent the damage was due to decay, or over-ripeness; in 85 cars or 5.9 per cent the damage was due to the pilferage of one-half box or more; in 83 cars or 5.8 per cent the damage was due to improper bracing; in 64 cars or 4.5 per cent the damage was due to field or orchard diseases; in 56 cars or 3.9 per cent the cause was rough handling; in 39 cars or 2.7 per cent the cause was field frost; in 31 cars or 2.2 per cent the damage was caused by shifted loads and in 21 cars or 1.5 per cent the damage was caused by poor containers. Of the 894 cars damaged by freezing in transit 447 were loaded with white potatoes, 118 with apples, 88 with lettuce, 51 with cabbage, 42 with oranges, 43 with celery and 33 with onions.

Coal from Alberta

The Province of Alberta, Canada, produced in 1923, a total of 6,866,924 tons of coal, of which 63,557 tons was sold to the United States. About 2,000,000 tons was sold to other Canadian provinces and about 3,000,000 tons to railway companies. The total output was about 1,000,000 tons greater than in 1922.

New Industries on P. R. R.

A total of 513 new industries, developing freight traffic estimated at more than 6,500,000 tons annually, were established on the lines of the Pennsylvania Railroad System in 1923, according to a report just issued. Provision has already been made for the construction of 237 private sidings for these industries. The new projects, include textiles, automobiles, building materials, chemicals and paints, iron and steel products, electrical supplies, food, fuel, leather goods and many other things.

Surcharge Hearings Concluded

Hearings before Commissioners Campbell and Cox and Examiner Keeler in connection with the Interstate Commerce Commission's investigation of the Pullman surcharge were concluded on March 19 and Commissioner Campbell announced that it had been decided to separate that part of the case from that involving Pullman rates which had been consolidated with it. The case will be set down for early argument and further testimony will be taken later on the Pullman rates, which he said cannot be disposed of for some time to come. The hearing on March 19 was devoted mainly to the final details of the statistical testimony.

E. J. Engel, vice-president of the Atchison, Topeka & Santa Fe was questioned regarding that company's new contract with the Pullman Company entered into on January 1, 1923. Under the new contract the first $9,000 of earnings per car per year goes to the Pullman Company, the next $1,500 goes to the railroad; on earnings between $10,500 and $14,500 the two companies share equally and on any earnings above $14,500 the railroad gets three-fourths. Examiner Keeler said that this seemed to be less favorable to the railroad than the former contract under which the division point was $7,250 and the railroad received the next $1,500 and half of any earnings above $8,750. Mr. Engel said that because of the increase in the expense of the Pullman Company, to offset which the Pullman rates had been increased in 1920, it was necessary to increase the division point, but that aside from that change the present contract is more favorable if the earnings should exceed $14,500 and the same if they do not. He said that at the time the contract was made the Pullman Company's expenses had been averaging over $9,000 per car but that provision was made for a modification of the contract if conditions change. The earnings received by the railroad last year were around $3,000 per car but the expenses of the railroad, although not capable of exact determination, he said would range from $1,200 to $1,800 per car.

L. S. Taylor, vice-president of the Pullman Company, said that after the Pullman rates were increased about half of the increase went to the railroads until the contracts could be readjusted, and that for a time the company operated at a considerable loss on many lines. The new contracts were based on the increase in rates and the increase in expense that had required the increase in rates. He said that any return on the Pullman Company's investment is dependent upon a further reduction of its expenses, which are now down to about $8,000 per car per year. Counsel for the commercial travelers' organizations asked questions to bring out from both Mr. Taylor and Mr. Engel that the fact that the railroad receives the surcharge is not taken into consideration in negotiating the contracts between the Pullman Company and the railroads.

Commissioner Campbell said that the commission would probably consider whether or not, as some roads have better contracts than others, the contracts may not be so revised as to remove the need for a surcharge. In reply to a question by Commissioner Campbell at a previous hearing as to whether the roads had any plan to suggest for raising the same amount of revenue in some other way in case the commission should decide that the surcharge should be abolished but that the railroads still need the revenue, a statement was filed in which the railroads took the position that the present method is the best that can be devised from the standpoint of convenience to the public. The Pullman Company takes the position that if there is to be a surcharge it should be collected by the railroads and the commercial travelers object to the money being collected from the traveling public in any form.

Conference with Shippers at Grand Rapids

The Great Lakes Shippers' Regional Advisory Board held its fifth bi-monthly meeting at Grand Rapids, Mich., on February 19 with an attendance of about 175, two-thirds of whom were industrial traffic managers and the rest of whom were railroad officers. Several new commodity committees were appointed and the whole field is now well covered. M. M. Twohig, of the Willard Storage Battery Company, Cleveland, Ohio, was made chairman of the general publicity committee. The principal discussions were on cleaning box cars and on detention of refrigerator cars, reports being made by Frank Larkin and E. S. Briggs. Brief reports were made by representatives of other committees. The consensus of opinion was that the country will need this year 5 to 10 per cent more freight cars than last year. The next meeting will be held at Erie, Pa., on Tuesday, April 8.

Advisory Shipping Committee Named

President Coolidge has appointed two advisory shipping committees, one to consider co-ordination of rail and water transportation and the other to study the replacement needs of the American merchant marine. This action was suggested to the President by Senator Jones in a memorandum on the situation of the Shipping Board in December. The committee on co-ordination of rail and water transportation is to consist of Secretary Hoover of the Department of Commerce, Chairman Hall of the Interstate Commerce Commission, Chairman O'Connor of the Shipping Board, President Palmer of the Emergency Fleet Corporation, a practical railroad man and a practical shipping man. The replacement committee includes Secretaries Mellon of the Treasury, Weeks of the War Department, Hoover of the Commerce Department, Wilbur of the Navy, Chairman O'Connor and President Palmer. This committee has already held a preliminary conference with the President.

Dr. Arthur T. Hadley, former president of Yale University, delivered a lecture on Railroad Transportation and National Development on the evening of March 19 before the Carnegie Institute at Pittsburgh, Pa.; and this was followed on subsequent days by a lecture on Rate Making and a third on Methods of Government Control.

Commission and Court News

Interstate Commerce Commission

Upon further consideration of the record in Arizona Corporation Commission et al., v. Arizona Eastern Railroad Company et al., after the railroads had asked for a rehearing, the commission has issued a modification of its order in this case, which reduced the main line passenger fares in Arizona, Nevada and New Mexico. The commission now finds that the maintenance of interstate passenger fares between points on the Denver & Rio Grande Western and points on lines designated in its order in Arizona, Nevada and New Mexico, higher than 3.6 cents per mile, in so far as the transportation takes place over any of the lines of the Denver & Rio Grande Western in Colorado and Utah upon which the present basis of interstate passenger fares is in excess of 3.6 cents per miles, was not, is not and for the future will not be unreasonable, unjustly discriminatory or unduly prejudicial. The modification also excepts fares between points on branch lines of the other defendants without the states of Arizona, Nevada and New Mexico and points within those states in so far as such transportation takes place over branch lines. Commissioners Aitchison, Campbell, Cox and McManamy dissented from the findings of the majority to the extent that they apply to fares to and from Denver & Rio Grande Western main line points.

Personnel of Commissions

Edward R. McLean, secretary of the Railroad Commission of Texas, died at Austin, Tex., on February 17.

E. S. Matthews has been appointed a member of the Railroad Commission of Florida in place of A. D. Campbell, deceased.

Court News

Terminal Carriers Amenable to 28-Hour Law

The Circuit Court of Appeals, Eighth Circuit, holds that a terminal company is a common carrier and so amenable to the 28-Hour Law.—United States v. Chicago, B. & Q., 293 Fed. 185.

Actions Under State Law and Federal Employers' Liability Act Removable to Federal Court

The Arkansas Supreme Court holds that where the petition in an action against a railroad company states a cause of action under the state law and another cause of action under the federal Employers' Liability Act, the whole case is removable to the federal courts on the ground of diversity of citizenship.—St. Louis-S. F. v. Boudreaux (Ark.) 252 S. W. 913.

"Doing Business" in State Within Maryland Statute

The selling in Maryland of through tickets over a resident and a non-resident company's lines by the resident company's ticket agent, and its issuance of bills of lading and collection of entire freight for shipments over both lines is not "doing business" within the state by the non-resident company within the Maryland statute rendering it liable to suit commenced by service on the ticket agent.—Stuart Fruit Co. v. Chicago, M. & St. P. (Md.) 121 Atl. 837.

Railroad Not Liable for Delay Occurring After Unavoidable Freezing of Goods

Where pickles were frozen in transit, the Michigan Supreme Court holds that the carrier was liable only if its negligence caused the loss, and where delay in transit occurred only after the shipment had been subjected to destructive temperatures, which could not have been avoided, neither the delay, routing over connecting line or failure to notify consignee of embargo, was the proximate cause of the loss.—Standard Pickle Co. v. P. M. (Mich.) 193 N. W. 300.

Labor News

The Pittsburgh & West Virginia has advanced the pay of enginemen and firemen about 5 per cent.

William C. Turner, vice-president of the Order of Railway Conductors, died in St. Louis, Mo., on March 11. Mr. Turner was 68 years of age and had served as vice-president of the brotherhood since 1913. Prior to that time he was general chairman of the Order on the Missouri Pacific.

The advance in wages of conductors and trainmen on the Baltimore & Ohio, as reported last week, is said to amount to between 5 and 6 per cent. The number of men affected is about 8,000. The Baltimore & Ohio has advanced the wages of enginemen, firemen and hostlers, as of March 16, between 5 and 6 per cent. The number of men affected is about 6,000.

The Southern Railway has advanced the pay of enginemen and firemen between 5 and 6 per cent, substantially the same increase that was given to the conductors and brakemen. The agreement also provides for a bonus and goes into effect on March 1. The bonus arrangement is substantially the same as that agreed upon with the conductors and brakemen, as described in the *Railway Age* of March 8, page 554; duration, three years.

The Pennsylvania Railroad announced on March 14 that the pay of conductors, baggagemen, brakemen and switch tenders had been increased about 6.2 per cent, the number of individuals affected being about 32,000. Negotiations with the representatives of the employees followed an exhaustive study made by a joint fact-finding committee. The increases per day are as follows: in the passenger service, 30 cents; freight service, 36 cents; yard conductors, 40 cents; yard brakemen, 32 cents; switch tenders, 32 cents. Under the new agreement, the company, for the first time, guarantees a minimum amount of pay for each day's service, which will be substantially more than under the schedule heretofore prevailing. This minimum was fixed after careful consideration of average actual earnings.

The Long Island Railroad has made an advance of 5 per cent in the wages of employees in the passenger train service and yard train service; and an increase, somewhat smaller, in the freight train service.

Shopmen to Demand Wage Increase

The railway employees' department of the American Federation of Labor is about to demand wage increases of 4 cents an hour for the shopmen it represents, according to a report in Chicago. The fact that the shopmen have already asked such an increase on the Southern and the Mobile & Ohio is considered as an indication of a concerted drive for general increases.

Western Roads Confer on Wage Increase

The Conference Committee of Managers, Western Railways, began a series of conferences with the train service brotherhoods in Chicago on March 19 to act upon the request of the brotherhoods for wage increases of approximately 12 per cent. This conference is the first action that the western roads have taken upon the trainmen's demands, previous negotiations having been confined to eastern railways.

L. E. Sheppard, president of the Order of Railway Conductors, and W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen, represented the employees. The Conference Committee of Managers consisted of W. M. Jeffers, general manager, Union Pacific, chairman; W. F. Thiehoff, general manager, Chicago, Burlington & Quincy; F. G. Pettibone, vice-president and general manager, Gulf, Colorado & Santa Fe; A. E. Clift, vice-president, Illinois Central; F. G. Nicholson, vice-president and general manager, Chicago & Eastern Illinois; J. M. Rapelje, vice-president, Northern Pacific; G. S. Waid, vice-president and general manager Southern Pacific Lines; J. E. Hutchison, vice-president, St. Louis-San Francisco; Frank Walters, general manager, Chicago & North Western, and J. T. Gillick, general manager, Chicago, Milwaukee & St. Paul.

Foreign Railway News

American Firms Said to Have Turkish Construction Contract

According to press dispatches from Constantinople, the Minister of Public Works of Turkey plans to approve a contract between the Turkish government and Stone & Webster and Ulen & Company of New York, calling for the construction by the American firms of a line of railway fifty miles in length southward from the Black Sea port of Ineboli.

Chilean State Railway Purchases

The Chilean State Railways have recently published a list of materials needed for railway operation in 1924, on which bids are asked, according to Commerce Reports. The list includes a group of repair parts for locomotives, cars, and coaches, amounting to about 3,882,000 pesos (approximately $388,200 at current exchange), on which bids are due May 6. American firms with representatives in Chile who are familiar with the routine of government bids may be interested in submitting tenders. Specifications are on sale in the Secretaria del Departmento de Materiales y Almacenes en la Estacion de Alameda, Santiago.

New General Manager for the L. M. S.

Sir Arthur Watson, general manager of the London, Midland & Scottish, has retired on account of ill-health and has been succeeded by the Rt. Hon. H. G. Burgess, principal assistant to the general manager. Mr. Burgess served as general manager for the old London & North Western in Scotland and in Ireland, and in 1919 was appointed director of Irish transport for the Ministry of Transport. In 1920 he became principal assistant to the general manager of the London & North Western and retained that position when that company, by amalgamation, was enlarged to form the London, Midland & Scottish.

The company has also announced the appointment of H. L. Thornhill as chief solicitor.

Standardization of Freight Cars in England

A plan for standardization of railway freight cars has been arranged between the railway clearing house for the companies and the private car owners, by which all freight cars built in future will be of two standard specifications only—12-ton and 20-ton, according to Trade Commissioner Smith at London. This change, contemplated for years, may be attributed largely to the unification of railways under the act of 1921. Great savings are anticipated eventually from this plan, not only in facilitating repair and in aiding train assembly, but also in cheapening first cost and in promoting mass production.

Quantity output schemes are already being introduced at car-building plants. At Cardiff, an extension of the Crown Wagon & Engineering Works is under way to expedite the specialized construction of steel-frame box cars and the construction of the new 20-ton coal cars. The Great Western Railway serving that territory urges colliery owners to adopt the 20-ton size, and offers a 5 per cent freight rebate on coal traffic so carried.

Japanese Railways Extend Time Limit on Improvement Program

TOKYO.

The Japanese Department of Railways has, in view of the heavy expenses necessitated by the September quake, altered its ten-year construction and repair program recently adopted. The total amount of capital to be spent for the realization of the plan has not been changed, but the time limit on the program has been placed at eleven or twelve years.

The whole construction budget is given at 612,995,000 yen. Of this total 27,404,000 yen is to be set aside for the purchase of locomotives and cars. The credit for repairs and improvement is placed at 676,960,000 yen. Of the figure 150,127,000 yen is to be spent in purchasing locomotives and cars. The purchase of locomotives and cars is to be completed by 1928. The electrification of some trunk lines figures prominently in the altered program. The Department of Railways proposes to spend 81,000,000 yen for the installation of electric plants. Roughly 300,000,000 yen is to be used in replacing old rails.

British Lines Earn Substantial Dividends—Deficits in France

The privately owned British railways which were amalgamated into four large systems at the beginning of 1923 are yielding 6 per cent to 8½ per cent on the dividend basis for 1923, according to the Wall Street Journal. Prices and yield are:

Security	Dividend 1923	Prices of 1923 highest	Prices of 1923 lowest	Price Feb. 22, 1924	Present yield £ s d
Gt. Western ord. stock	8%	118¾	106½	113	7 4 9
London & N. Eastern—					
5% pref. ord. stock	5	89¼	75	84⅞	5 17 0
Deferred ord. stock	2½	39⅞	28½	33	7 11 6
London, Midland & Scottish—ord. stock	7	108¾	101¾	103¼	6 15 6
Southern—pref. ord. stock	5	89⅜	76½	84¾	5 18 0
Deferred ord. stock	3½	43¾	34¼	43¼	8 1 9
Ord. A stock	3½	40⅞	31½	40½	8 12 9
Ord. B stock	...	16½	10½	11⅜	nil

On the other hand, the railways of France which are, technically speaking, privately owned, but which operate under government guaranties and are so closely controlled by the government as to amount practically to government lines, showed startling increases in their already heavy deficits. These are shown by the Wall Street Journal in millions of francs as follows:

	1923*	1922	1921	1920
State Lines	460	383	642	734
Northern	188	119	247	578
Eastern	55	7	159	303
P. L. M.	180	244	407	633
Paris-Orléans	215	237	369	494
Southern	140	156	186	255
Totals	1,238	1,146	2,010	2,997

* 1923 figures provisional.

South African Railways Had Good Year

In spite of unfavorable economic conditions prevailing in the early part of the fiscal year ended March 31, 1923, the railways of the Union of South Africa had a fairly successful year, according to an analysis of the annual report of their general manager, by the Transportation Division of the Department of Commerce. Compared with the previous fiscal year, gains are shown in the carriage of passengers and freight, although the gross earnings from these sources were lower, due in some measure to reductions in rates on cereals, farm products, ore, lumber, and other basic commodities.

On March 31, 1923, the railways had a total open trackage of 10,986 miles, while the total mileage operated by the administration was 11,628. The railways are of two gages, namely, 3 ft. 6 in. and 2 ft.

While no new lines were opened during the year, there was an increase as compared with previous year's open mileage of 1,331 miles, representing the mileage of railways in Southwest Africa incorporated in the Union system on April 1, 1922, and 97 miles of deviations constructed in Natal. The total capital cost of the 10,986 miles as of March 31, 1923, was $481,357,873, or approximately $43,812 per mile of line (exchange $4.43 to pound sterling).

During the year, 61,582,447 passengers were carried, an increase of 0.25 per cent over the previous year. Revenue freight traffic carried amounted to 15,718,864 net tons, or 3.27 per cent greater than for the fiscal year 1921-22. Coal made up the greater part of the traffic, over 8 million tons of this commodity having been hauled. The gross earnings amounted to $89,250,311, or approximately $8,125 per open mile of line. Compared with the previous year, this was a decrease of 3.17 per cent.

The operating ratio, which in 1921-22 was 82.7 per cent, was reduced in 1922-23 to 77.1 per cent. This decrease in expenditure was due principally to savings effected in salaries and wages, reduction of staff, reduced overtime payments, lower quantity and cost of stores and materials, decreased claims payments and savings effected in the maintenance of buildings. From April 1 to August 31, 1923, freight traffic was exceedingly heavy, and a marked improvement in the financial condition of the railways is looked for, as earnings exceeded those of the same period in 1922 by 7.3 per cent.

Equipment and Supplies

Locomotives

THE CHESAPEAKE & OHIO contemplates buying about 50 locomotives.

THE EL PASO & SOUTHWESTERN is inquiring for 6 Mountain type locomotives.

THE COMMONWEALTH STEEL COMPANY is inquiring for one 6-wheel switching locomotive.

THE WABASH has ordered one 8-wheel switching locomotive from the American Locomotive Company.

THE READING COMPANY has given a contract to the Baldwin Locomotive Works for 5 Pacific type locomotives.

THE FLORIDA EAST COAST is inquiring for 20 Mountain type locomotives and five 8-wheel switching type locomotives.

THE PACIFIC STATES LUMBER COMPANY has ordered one 90-ton, three-truck, Shea type locomotive from the Lima Locomotive Works.

THE PITTSBURGH & WEST VIRGINIA, reported in the *Railway Age* of March 8 as having placed an order for one Pacific type locomotive, gave the order for this locomotive to the American Locomotive Company.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of March 1 as inquiring for 18 Mikado type, six Pacific type and six 8-wheel switching type locomotives, has ordered this equipment from the American Locomotive Company.

THE SOUTHERN RAILWAY, reported in the *Railway Age* of March 1 as inquiring for 25 locomotives, has ordered 20 switching type locomotives from the American Locomotive Company and has also five Mallet type locomotives from the Baldwin Locomotive Works.

Freight Cars

THE ELGIN, JOLIET & EASTERN is inquiring for 500 coke cars.

THE WESTERN FRUIT EXPRESS COMPANY is inquiring for 1,000 underframes.

THE SEABOARD AIR LINE has ordered 25 ballast cars from the Rodger Ballast Car Company.

THE CENTRAL OF BRAZIL is inquiring through the car builders for about 50 refrigerator cars.

THE NORTHERN REFRIGERATOR COMPANY has ordered 500 refrigerator cars from the Pullman Company.

THE RICHMOND, FREDERICKSBURG & POTOMAC has ordered 15 ballast cars from the Rodger Ballast Car Company.

THE UNION REFRIGERATOR TRANSIT COMPANY, Milwaukee, Wis., will build 250 refrigerator cars in its own shops.

THE SKELLY OIL COMPANY, Tulsa, Okla., has ordered 35 insulated, 8,050 gal., class IV tank cars from the Standard Tank Car Company.

THE CHESAPEAKE & OHIO is inquiring for 3,000 hopper bottom gondola cars of 57½ tons' capacity and 2,000 automobile box cars with steel frame, of 40 tons' capacity.

THE FLORIDA EAST COAST has authorized the purchase of 20 caboose cars, 200 ventilated box cars, 250 rock cars and 100 ballast cars. It is expected that bids for some of this equipment will be asked for in the near future.

THE NORFOLK & WESTERN, reported in the *Railway Age* of March 1 as asking for prices on the rebuilding, to include new bodies, of 1000 all-steel gondola cars of 57½ tons' capacity, has given the order for rebuilding 700 of these cars to the Ralston Steel Car Company and for 300 to the Virginia Bridge & Iron Company.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of March 1 as inquiring for 5,000 cars, has ordered 1,150 box cars, 500 automobile cars and 150 flat cars from the Chickasaw Shipbuilding & Car Company; 500 box cars from the Mount Vernon Car Manufacturing Company; 500 automobile cars and 1,100 steel gondola cars from the Pressed Steel Car Company.

THE SOUTHERN RAILWAY ordered 750 hopper cars from the Standard Steel Car Company and 1,250 gondola cars from the Chickasaw Shipbuilding & Car Co., instead of 1,200 cars from the Standard Steel Car Co., and 800 from the Chickasaw Shipbuilding & Car Co., as was reported in our issue of March 15. The company may increase the order for gondola cars.

Passenger Cars

THE FLORIDA EAST COAST has authorized the purchase of one steel dining car.

THE EL PASO & SOUTHWESTERN is inquiring for three buffet baggage cars and one dining car.

THE VIRGINIAN RAILWAY has ordered one business car from the Bethlehem Shipbuilding Corporation, Inc.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for 10 postal cars in addition to those reported in the *Railway Age* of February 2.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of February 2 as inquiring for 6 business cars, has ordered this equipment from the Pullman Company.

THE INTERNATIONAL-GREAT NORTHERN, reported in the *Railway Age* of January 26 as inquiring for three coaches, two chair cars, one baggage and mail car and four baggage cars, has ordered these passenger train cars from the American Car & Foundry Company.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of March 15 as inquiring for 34 cars for passenger service, has placed an order for 20 coaches with the American Car & Foundry Company and for 8 baggage cars and 6 combination baggage and mail cars with the Pressed Steel Car Company.

THE SOUTHERN RAILWAY, reported in the *Railway Age* of March 1 as inquiring for 50 cars for passenger service, has ordered 25 steel coaches from the Bethlehem Shipbuilding Corporation, Ltd.; 12 steel combination baggage and express cars, 2 steel postal cars and 6 steel combination mail and baggage cars from the American Car & Foundry Company; and 5 steel dining cars from the Pullman Company.

Iron and Steel

THE CHESAPEAKE & OHIO is inquiring for 400 tons of structural steel for a bridge at Dayton, Ky.

THE LONG ISLAND RAILROAD has ordered 130 tons of steel for bridges from the Fort Pitt Bridge Company.

THE NEW YORK CENTRAL has ordered 800 tons of steel for bridges from the American Bridge Company.

THE DELAWARE & HUDSON has ordered 800 tons of steel for bridges from the American Bridge Company.

THE LEHIGH & HUDSON RIVER has ordered 200 tons of steel for bridges from the Phoenix Bridge Company.

THE ERIE has ordered 191 tons of structural steel for use at Hornell, N. Y., from the Jones & Laughlin Co.

THE WESTERN PACIFIC has ordered 475 tons of structural steel, consisting of five spans for use at Shafter, Nev., from the Virginia Bridge & Iron Works.

THE WASHINGTON TERMINAL COMPANY, Washington, D. C., has ordered 300 tons of fabricated steel for train shed extension work from the Belmont Iron Works.

Machinery and Tools

THE ATCHISON, TOPEKA & SANTA FE is inquiring for one 15-ton electric traveling crane.

THE READING COMPANY has placed an order for a 4-ton grab bucket crane, 99 ft. span.

THE CANADIAN NATIONAL has ordered one 160-ton wrecking crane from the Industrial Works.

THE ATLANTIC COAST LINE is inquiring for two locomotive cranes of 12½ and 15-ton capacity.

THE PENNSYLVANIA has ordered one 10-ton underhung traveling crane from H. D. Conkey & Co.

THE CINCINNATI, INDIANAPOLIS & WESTERN is inquiring for one hydraulic wheel press, also for one 200-ton locomotive hoist.

THE BESSEMER & LAKE ERIE has ordered one 25-ton, 8-wheel standard gage locomotive crane from the McMyler Interstate Company.

THE ATLANTIC COAST LINE has ordered two 12-ton, 8-wheel standard gage locomotive cranes from the American Hoist & Derrick Co.

THE SOUTHERN RAILWAY, reported in the *Railway Age* of February 23 as inquiring for a large number of machine tools, has ordered 11 electric traveling cranes from the Pawling & Harnischfeger Company.

THE CANADIAN NATIONAL has ordered two 25-ton, 8-wheel standard gage locomotive cranes from the Browning Company; two 20-ton cranes from the Industrial Works; one of 18 tons' from the Orton & Steinbrenner Company, and one of 35 tons' from the Ohio Locomotive Crane Company.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for one locomotive guide grinder, four double dry and two double wet grinders, one 4,000-lb. double frame steam hammer, one 20-in. by 12-ft. geared head engine lathe, one milling machine, two vertical drill presses, one 100-in. boring mill, one 6-in. radial drill, one 20-in. upright sensitive drill press, one 16-in. by 6-ft. portable lathe and two 14-in. by 6-ft portable lathes.

Track Specialties

THE WHEELING & LAKE ERIE is inquiring for from 100,000 to 150,000 tie plates.

Miscellaneous

THE NORFOLK & WESTERN will receive bids until 12 o'clock noon, March 26, at Norfolk, Va., for its requirements from April 1 to June 30, 1924, of steel springs; locomotive steel tires; wire fencing; couplers and parts, also for 30 cast steel truck bolsters and 140 cast steel side frames.

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon, April 1, for black galvanized and blue annealed sheets, driving and truck tires, seamless steel tubes, car and tender axles, wire nails and staples, steel bars, steel shapes and steel plates, steel billets, cast iron wheels, also for bridge repairs.

THE BALTIMORE & OHIO will ask for bids shortly for 4 steel car floats, similar to the two floats ordered last year. One of the new floats is to have 3 tracks, and 3 of the floats are to have 2 tracks, with a middle platform. The car floats are to be 39 ft. wide and 285 ft. long; bids will be received by James H. Clark, superintendent floating equipment, New York.

THE NATIONAL RAILWAY APPLIANCES ASSOCIATION has moved its office from the Peoples Gas building to the Seeberger building, 845 South Wabash avenue, Chicago.

Supply Trade News

J. L. Phillips, manager of the Atlantic office of the **Okonite Company,** has been transferred to San Francisco as manager of the San Francisco office, effective April 1.

The McMyler-Interstate Company, Cleveland, Ohio, has opened a new branch office at 619 Genesee building, Buffalo, N. Y., in charge of **J. E. McFate,** Buffalo district representative.

The Kelly-Derby Company has moved its office from the Peoples Gas building to its factory and warehouse at 321-3 North Crawford avenue, Chicago.

Howard W. Evans, vice-president and general manager of George B. Limbert & Co., Chicago, has been appointed executive vice-president and sales manager of **Warren Corning & Co.,** Chicago.

J. J. Edwards, vice-president of the **O. M. Edwards Company,** Syracuse, N. Y., has established his headquarters at the Chicago office of the company, First National Bank Building, where in conjunction with C. H. Rockwell, western manager, he will give special attention to the varied interests of that company. Mr. Edwards expects to be located in Chicago for about two years.

H. S. Brautigam, assistant to the master car builder of the Chicago, Milwaukee & St. Paul has resigned to become a representative of the railroad department of the **Allegheny Steel Company,** Brackenridge, Pa. Mr. Brautigam has served for about thirteen years in the car department of the Chicago, Milwaukee & St. Paul in various capacities, consecutively as clerk, car inspector, chief clerk, assistant car foreman, general safety appliance inspector and assistant to the master car builder.

R. C. Shaal, president of the **R. C. S. Equipment Company,** New York City, formerly vice-president of the Safety Car Heating & Lighting Co. in charge of electrical department, New York, and long associated with the sales department of the Pyle National Company as vice-president in charge of sales and maintenance for territory east of Chicago, and other railway supply companies, is now associated with the **Standard Stoker Company, Inc.,** at New York, in special sales work. Mr. Shaal will continue as president of the R. C. Shaal Company and retain the relations which he holds in other companies.

John Emory Meek, whose promotion to vice-president of **Johns-Manville, Inc.,** with headquarters at New York, was reported in the *Railway Age* of March 15, was born at State College, Pa. He served seven years with the Pennsylvania Railroad at Altoona, Pa., shops, later going to Denver, Colo., in 1888, remaining there for six years, the last three years of which he was chief engineer of power plant. He entered the employ of the H. W. Johns Company, New York City, in 1894, and went with the new organization of the H. W. Johns-Manville Company in 1902, and formed the railroad and United States government departments of this company in 1906, and has held the position of general manager of same up until his present promotion. He still retains direct supervision of these departments in addition to other duties. He is also a director of the corporation.

H. H. French, who has been in charge of the New York office of the Wood Shovel & Tool Co., has been appointed assistant to the president of the **Motors Terminal Company,** with headquarters at New York. Following his graduation from the School of Railway Engineering at the University of Illinois in 1914, Mr. French entered railway service in the engineering department of the Chicago & North Western, later leaving this road, to enter the employ of the Western Maryland. In 1916, he was appointed chief clerk to the consulting engineer of the Southern Pacific with headquarters at New York where he remained until 1918, when he entered engineering editorial work with the Engineering News Record. In 1921,

Mr. French left the employ of this paper to take charge of the New York office of the Wood Shovel & Tool Co., the position which he was holding at the time of his recent appointment as assistant to the president of the Motors Terminal Company, where he will be engaged in the engineering and development work on the use of unit containers, demountable bodies, etc., for the interchange of freight such as is employed by this company at Cincinnati, Ohio.

The Western Electric Company

The annual report of the Western Electric Company for the year ended December 31, 1923, shows a net income of $10,079,471, equal to $20.15 per share on the 500,000 shares of no par common stock outstanding. Sales during the year established a record with a total of $255,177,122, compared with $210,041,004 in 1922. Unfilled orders of the company on December 31, 1923, aggregated $94,951,000, or an increase of $32,882,000 over the total at the end of 1922.

The income account for 1923 and the balance sheet as of December 31, 1923, are as follows:

INCOME ACCOUNT

	1923	1922
Sales	$255,177,122	$210,941,004
Other income	1,302,874	2,690,836
	$256,479,996	$213,631,840
Cost of merchandise	$225,751,351	$189,418,973
Expenses	18,239,356	12,716,973
Taxes	2,409,818	1,860,004
Special appropriations	.....	400,000
	$246,400,525	$204,395,950
Available for interest and dividends	$10,079,471	$5,331,793
Interest deductions	$1,159,958	$3,904,097
Dividends—		
On preferred stock 7 per cent per annum	1,727,572	.....
On common stock, $10 per share, 500,000 shares	5,000,000	.....
	$7,887,530	$4,186,857
Balance carried to common stock	2,191,941	1,144,936

BALANCE SHEET

Assets

	1923	1922
Land, buildings and permanent fixtures	$23,449,884	$20,257,973
Machinery, tools and other equipment	33,915,918	28,947,552
	$57,365,802	$49,205,525
Investment in and advances to International Western Electric Company, Incorporated	14,476,865	15,135,561
Other investments	2,238,820	2,309,432
Merchandise, materials and supplies	69,349,002	52,701,893
Trade acceptances and bills receivable	1,066,727	1,200,838
Accounts receivable	44,311,960	36,624,943
Prepaid charges	462,556	.....
Marketable securities	108,000	.....
Liberty Bonds	.....	7,000
Cash	12,053,342	11,008,869
Total working assets	$127,351,587	$66,650,518
Grand total	$201,433,074	$168,194,061

Liabilities

Common stock, no par value, 500,000 shares authorized and issued	$77,128,767	$74,931,826
Preferred stock, 7 per cent cumulative, par value $100	24,679,600	24,679,600
Total capital stock	$101,803,367	$99,611,426
Bills payable	$35,000,000	$12,000,000
Trade acceptances and bills receivable discounted	$705,659	$618,563
Interest and taxes accrued not due	2,655,755	.....
Accounts payable	20,056,533	18,614,694
Total current liabilities	$58,417,947	$31,233,257
Reserve for depreciation on plant and equipment	34,404,141	30,431,368
For Employees' Benefit Fund	2,000,000	2,000,000
For Contingencies	4,807,619	4,918,010
Total reserves	$41,211,760	$37,349,378
Grand Total	$201,433,074	$168,194,061

Obituary

John M. Mack, inventor of the Mack truck and founder of the Mack Motorcar Company, which later became the International Motor Company, was killed March 14 near Neffs, Pa., when a work car of the Lehigh Valley Transit Company crashed into the automobile he was driving.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company closed bids on March 20 for the construction of an addition to the power house at Shopton, Ia., to cost approximately $15,000. This company also closed bids on March 20 for the construction of an addition to the lunchroom at Syracuse, Kan., at a cost of $20,000.

BEAVER, MEADE & ENGLEWOOD.—This company plans the immediate construction of an extension from Forgan, Okla., to Hooker, a distance of 39 miles, at an estimated cost of $559,500.

BOSTON & ALBANY.—This company has contracted for the construction of the baggage, mail and express portion of its passenger terminal development in Springfield, Mass. The cost of the work contracted for is estimated to be $600,000. Work on the main station building with track changes probably will not be undertaken until next year. The company is receiving bids on some trackage and bridge work between Niverville, N. Y., and Post Road Crossing. This work is in connection with the Hudson River Connecting Railroad and the Castleton bridge. The Boston & Albany has awarded a contract for the interlocking tower at its junction with the Hudson River Connecting and has received bids for the signaling and interlocking. The company is contemplating the replacement of dry ash pits at its Beacon Park (Boston) terminal with water pits and has under consideration the rebuilding of a number of railway and highway bridges.

CANADIAN NATIONAL.—This company has completed surveys for the construction of a branch line from Brule Lake, Alberta, to Grand Prairie, in the Peace river region, reported in the *Railway Age* of October 6.

CHICAGO, BURLINGTON & QUINCY.—This company plans the construction of an addition to the roundhouse and extensions to the yard tracks at Gibson, Neb., at an estimated cost of $170,000.

CHICAGO, BURLINGTON & QUINCY.—This company has rejected bids for the construction of a roundhouse at Denver, Colo., and will call for new bids in the near future.

FLORIDA EAST COAST.—This company will begin immediately the double-tracking of its line between Jacksonville, Fla., and Miami (366 miles). The company will also build a 19-mile belt line around the city of Miami in order that freight traffic may be moved around, rather than through, the congested urban area.

GREAT NORTHERN.—This company has authorized reductions in grade between Scotia, Idaho, and Newport, a distance of eight miles, and at Sandpoint, Idaho, and additional yard tracks at Sandpoint, at a total cost of $150,000. The construction of a pumping plant and water supply system, including a 100,000-gal. water tank at Hillyard, Wash., has also been authorized.

HAMPTON & BRANCHVILLE RAILROAD & LUMBER COMPANY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Smoaks to Summerville, S. C., of which it is proposed to build only 12 miles, from Smoaks to Canadys Cross Roads, at this time.

ILLINOIS CENTRAL.—This company plans the construction of a mail terminal at Memphis, Tenn., to cost approximately $250,000.

LOUISVILLE & NASHVILLE.—This company plans the construction of shops, a roundhouse and other terminal facilities at Leewood, northeast of Memphis, Tenn., at an estimated cost of $500,000.

MISSOURI PACIFIC.—This company will rebuild at once its machine shop and power house at Monroe, La., recently damaged by fire with a reported loss of $100,000.

MISSISSIPPI SOUTHERN.—This company plans the construction of a 14-mile extension from Kiln, Miss., to Pass Christian, where it will connect with the Louisville & Nashville.

MISSOURI PACIFIC.—This company has awarded a contract to the Kellermann Contracting Company, St. Louis, Mo., for the construction of an addition to the storehouse at Ewing avenue, St. Louis, Mo.

NEW YORK, CHICAGO & ST. LOUIS.—This company plans the construction of an addition to its roundhouse at Sharonville, Ohio.

OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.—This company has been authorized by the Interstate Commerce Commission to construct and operate in common with the Walla Walla Valley a branch line of three miles to the village of Umapine, Ore.

PRESCOTT & NORTHWESTERN.—This company plans the construction of a 26-mile extension from Prescott to the Nevada county, Ark., oil fields.

RIO GRANDE CITY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Sam Fordyce to Rio Grande City, Tex., 22 miles. J. B. Carrington, San Antonio, Tex., is secretary-treasurer.

ST. LOUIS-SAN FRANCISCO.—This company closed bids on March 12 for the construction of a passenger station at Bristow, Okla., reported in the *Railway Age* of March 17, 1923.

SEABOARD AIR LINE.—This company is contemplating the revision, enlargement and modernization of its team track facilities at Atlanta, Ga. Several extensions of industrial spur tracks, varying from one to two miles in length in Georgia and Florida, are also planned. A new freight station and team track facilities are contemplated for Orlando, Fla.

SOUTHERN PACIFIC.—This company, jointly with the Pacific Electric, has purchased land near Watson Station, Cal., on the Los Angeles Harbor Line, upon which to construct a freight classification yard with a capacity of 5,000 cars. The construction is estimated to cost $1,750,000.

SOUTHERN PACIFIC.—This company has awarded a contract to the Utah Construction Company, San Francisco, Cal., for the construction of a tunnel, two miles long, between Lake View, Cal., and the summit of the Sierra Nevada Mountains.

SOUTHERN.—This company will build a 17-mile cut-off from Bulls Gap, Tenn., on its Knoxville-Bristol line to Leadville, Tenn., on its Morristown-Asheville line. Contract for grading and masonry has already been let. The new line will save a haul of 11.5 miles in the haul from Bulls Gap to Asheville and will provide much easier gradients for the coal traffic moving from the Southwest Virginia fields to Carolina territory.

TIMISKAMING & NORTHERN ONTARIO.—This company is planning improvements throughout its system from North Bay to the northern terminus at the end of steel north of Cochrane, according to an announcement made at North Bay by George H. Lee, chairman of the Ontario Government Commission which directs the road. The largest item will be the replacing of 40 miles of 80-pound steel between North Bay and Englehart with 90-pound steel, of Canadian manufacture. This work will commence on April 15. Tie replacement will be general throughout the entire road, it being planned to lay 175,000 ties this year. Much ballasting will be done and the Kirkland Lake branch line will be completed.

EMPLOYEES in the shops of the American Locomotive Company at Dunkirk, N. Y., have accepted a reduction in wages of about 10 per cent, the request of the company having been made on the basis of the argument that without such a reduction certain orders for work could not be secured. As the result of the agreement these shops are to build 25 locomotives for the Union Pacific and 24 for the Louisville & Nashville. The shopmen have requested local merchants and physicians to reduce their prices to correspond with the prospective reduction in the incomes of the petitioners.

THE STATE OF MISSISSIPPI has finally lost its suit, instituted in 1912, to annul the merger of the Southern Railway and allied companies in Mississippi. The case was dismissed on March 12 by Chancellor George C. Tann at Meridian, Miss. The suit was directed against the Southern Railway, the Southern Railway in Mississippi, the Mobile & Ohio, the Alabama Great Southern, the New Orleans & Northeastern and the Alabama & Vicksburg, and charged violation of the state anti-trust law. At the first trial the state was victorious, but an appeal to the State Supreme Court resulted in a reversal and order for retrial.

Railway Financial News

BOSTON & MAINE.—*Consolidation.—Membership of Board.*—In issuing the call for the annual meeting on April 9, the management expresses disapproval of the resolution of E. D. Codman against any future consolidation with the New Haven. The circular sent to the stockholders states that to take any action at this time will, in the opinion of the management, be prejudicial and may embarrass the future negotiations and action of the company.

The proposal of the voting trustees to drop five of the present directors and to add seven new directors in their places, making 21 in all, will be considered at the annual meeting.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a surplus of $715,201 as compared with $153,963 in 1922. The condensed income statement follows:

	1923	1922	Increase or decrease
Gross operating revenues	$17,923,547	$16,031,587	$1,891,961
Total operating expenses	12,943,458	12,161,144	782,314
Net operating revenues	4,980,090	3,870,443	1,109,647
Taxes, etc.	1,044,799	775,302	269,497
Net operating income	3,935,291	3,095,141	840,150
Other operating charges	1,582,257	1,285,293	296,963
Net railway operating income	2,353,034	1,809,847	543,187
Non-operating income	165,034	146,775	18,259
Total gross income	2,518,068	1,956,622	561,445
Deductions from total gross income	1,262,062	1,261,855	207
Balance of income over charges	1,256,006	694,768	561,238
Dividends declared	540,805	540,805	.....
Surplus (credit)	715,201	153,963	561,238

CHICAGO, PEORIA & ST. LOUIS.—*Foreclosure Proceedings.*—The Bankers Trust Company of New York has filed a foreclosure suit in Sangamon County Circuit Court, Springfield, Ill., to recover 10 locomotives, 200 box cars and 400 coal cars sold to the Chicago, Peoria & St. Louis in 1913 for $692,700, of which $102,700 was paid in cash and the balance of $590,000 in 6 per cent equipment notes. It is alleged that the Chicago, Peoria & St. Louis defaulted payment on November 1, 1923, of interest charges on the notes.

CHICAGO, ROCK ISLAND & PACIFIC.—*Bond Issue.*—The Interstate Commerce Commission has authorized an issue of $1,000,000 of general mortgage gold bonds to be delivered to the trustee under the first and refunding mortgage, and $1,000,000 of first and refunding mortgage gold bonds to be pledged and repledged from time to time as collateral security for notes.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Common Dividend Increased.*—The directors have declared a quarterly dividend of 1¼ per cent on the common stock and the regular quarterly 1¼ per cent on the preferred, both payable April 19 to stock of record April 1. In the four preceding quarters, distributions of 1 per cent each were paid on the common.

GEORGIA & FLORIDA.—*Certificates of Indebtedness.*—The receiver has applied to the Interstate Commerce Commission for authority for an issue of $1,600,000 of three-year 8 per cent certificates of indebtedness, part of which are to be substituted for other collateral for a government loan and part to be sold at par or exchanged for maturing certificates already outstanding.

LEHIGH VALLEY.—*Bond Issue.*—This company has applied to the Interstate Commerce Commission for authority to issue and pledge $10,400,000 of general consolidated mortgage 5 per cent bonds, to reimburse the treasury for expenditures, and also to pledge $5,000,000 of general consolidated mortgage 4 per cent bonds now held in the treasury.

LEHIGH VALLEY.—*Rights.*—The committee on securities of the New York Stock Exchange, in connection with the announcement of the Lehigh Valley, that stockholders of record at noon, March 15, would receive warrants on or before June 15, at $1 per share for certificates of interest in stock of the Lehigh Valley Coal Company, ruled that the railroad stock should not be quoted ex-rights until further notice, but that all deliveries after March 15 must be accompanied by a due-bill. The due-bill stipulates

(*Continued on page* 818)

Annual Report

Norfolk and Western Railway Company—Twenty-Eighth Annual Report

ROANOKE, VA., March 12th, 1924.

To the Stockholders of the Norfolk and Western Railway Company:

Your Board of Directors submits the following report for the year ending December 31st, 1923.

MILEAGE OF ROAD AND TRACK IN OPERATION.

	DECEMBER 31ST, 1923 Miles		DECEMBER 31ST, 1922 Miles		INCREASE OR DECREASE Miles
Main Line		1,542.69		1,542.69	
Branches { Operated as second track	127.28		127.28		
Branches { Other branches	533.28		531.28		
		660.56		658.56	Inc. 2.00
Total miles		2,203.25		2,201.25	Inc. 2.00
Lines operated under lease		21.03		21.03	
Lines operated under trackage rights		15.60		15.60	
Total miles of road in operation		2,239.88		2,237.88	Inc. 2.00
Second track		556.40		556.95	Dec. .55
Third track		13.58		11.41	Inc. 2.17
Sidings and yard tracks		1,528.19		1,530.44	Dec. 2.25
Total miles of all tracks in operation		4,338.05		4,336.68	Inc. 1.37
Average miles of road operated		2,238.29		2,237.88	Inc. .41
Average miles of track operated		4,338.57		4,331.19	Inc. 7.38

The increase in miles of road in operation was as follows:

Town Hill Branch extension		3.33 Miles
Pelters Branch removed	0.73 Miles	
Allisonia Branch removed	0.60 Miles	1.33 Miles
Net Increase		2.00 Miles

INCOME STATEMENT.

(Corporate figures only)

	1923	1922	INCREASE OR DECREASE	PER CENT.
OPERATING INCOME:				
Operating Revenues:				
Freight	$81,321,868.14	$77,672,461.13	Inc. $3,649,407.01	4.70
Passenger	10,301,245.91	9,191,620.31	Inc. 1,109,625.60	12.07
Mail	989,497.35	933,419.52	Inc. 56,077.83	6.01
Express	1,237,913.22	1,204,963.91	Inc. 32,949.31	2.73
All other Transportation	578,610.39	485,727.55	Inc. 92,882.84	19.12
Incidental and Joint Facility Revenue	1,162,547.34	864,694.77	Inc. 297,852.57	34.45
Total	$95,591,682.35	$90,352,887.19	Inc. $5,238,795.16	5.80
Operating Expenses:				
Maintenance of Way and Structures	$12,408,975.49	$12,564,606.25	Dec. $155,630.76	1.24
Maintenance of Equipment	25,140,609.49	23,514,618.47	Inc. 1,625,991.02	6.91
Traffic	991,805.30	933,056.58	Inc. 58,748.72	6.30
Transportation	31,997,613.83	29,106,712.27	Inc. 2,890,901.56	9.93
Miscellaneous Operations	306,382.18	278,149.63	Inc. 28,232.55	10.15
General	1,869,052.28	1,773,753.61	Inc 95,298.67	5.37
Transportation for Investment—Credit	115,567.66	118,093.29	Dec. 2,525.63	2.14
Total	$72,598,870.91	$68,052,803.52	Inc. $4,546,067.39	6.68
Ratio of Expenses to Total Operating Revenues	75.95%	75.32%	Inc. .63%	
Net Revenue from Operations	$22,992,811.44	$22,300,083.67	Inc. $692,727.77	3.11
Tax Accruals	$6,225,000.00	$6,000,000.00	Inc. $225,000.00	3.75
Uncollectible Revenue	26,172.45	7,938.82	Inc. 18,233.63	229.68
Total Operating Income	$16,741,638.99	$16,292,144.85	Inc. $449,494.14	2.76
NON-OPERATING INCOME:				
Hire of Freight Cars—Net	3,003,995.37	2,161,001.85	Inc. 842,993.52	39.01
Hire of Other Equipment—Net	4,407.96	42,566.66	Inc. 46,974.62	....
Joint Facility Rents—Net	258,823.76	180,109.21	Inc. 78,714.55	43.70
Total	$3,267,227.09	$2,298,544.40	Inc. $968,682.69	42.14
NET RAILWAY OPERATING INCOME	$20,008,866.08	$18,590,689.25	Inc. $1,418,176.83	7.63
OTHER NON-OPERATING INCOME:				
Income from Lease of Road	*$1,025,519.00	$1,110.00	Inc. $1,024,409.00	....
Miscellaneous Rent Income	72,580.59	72,632.23	Dec. 51.64	.07
Miscellaneous Non-Operating Physical Property	41,089.09	82,880.66	Dec. 41,791.57	50.42
Dividend Income	5,047.32	3,648.65	Inc. 1,398.67	38.33
Income from Funded Securities	575,280.45	753,145.36	Dec. 177,864.91	23.62
Income from Unfunded Securities and Accounts	*1,855,592.05	269,876.49	Inc. 1,585,715.56	....
Miscellaneous Income	29,101.68	183.85	Inc. 28,917.83	....
Total	$3,604,210.18	$1,183,477.24	Inc. $2,420,732.94	204.54
GROSS INCOME	$23,613,076.26	$19,774,166.49	Inc. $3,838,909.77	19.41
DEDUCTIONS FROM GROSS INCOME:				
Rent for Leased Roads	$102,306.65	$100,619.95	Inc. $1,686.70	1.68
Miscellaneous Rents	1,453.70	1,149.40	Inc. 304.30	26.47
Interest on Funded Debt:				
Mortgage Bonds	3,589,600.00	3,589,540.00	Inc. 60.00	
Convertible Bonds	713,142.00	963,639.50	Dec. 250,497.50	25.99
Secured Notes	.....	50,000.00	Dec. 50,000.00	....
Equipment Obligations	319,870.87	454,609.40	Dec. 134,738.53	29.64
Interest on Unfunded Debt	33,232.26	14,141.77	Inc. 19,090.49	134.99
Miscellaneous Income Charges	64,973.90	45,477.56	Inc. 19,496.34	42.87
Total	$4,824,579.38	$5,219,177.58	Dec. $394,598.20	7.56
NET INCOME	$18,788,496.88	$14,554,988.91	Inc. $4,233,507.97	29.09
Dividends on Adjustment Preferred Stock	919,692.00	919,692.00	.....	....
INCOME BALANCE: Transferred to Profit and Loss	$17,868,804.88	$13,635,296.91	Inc. $4,233,507.97	31.05

*Include payments in connection with settlement with United States Railroad Administration.

PROFIT AND LOSS STATEMENT.

	1923	1922	INCREASE OR DECREASE	PER CENT.
CREDITS:				
Balance January 1st	$37,276,019.65	$35,524,370.63	Inc $1,751,649.02	4.93
Credit Balance from Income	17,868,804.88	13,635,296.91	Inc. 4,233,507.97	31.05
Unrefundable Overcharges	274.87	4,052.97	Dec. 3,778.10	93.22
Repayment by Pocahontas Coal & Coke Company, Advances for Mortgage Bond Interest	70,000.00	70,000.00	.....	....
Profit on Road and Equipment Sold	9,841.73	16,455.97	Dec. 6,614.24	40.19
Donations for Construction of Sidings	114,844.69	41,797.47	Inc. 73,047.22	174.76
Adjustment of Equipment Retired, and Materials and Supplies in settlement with U. S. Railroad Administration	947,427.02	.....	Inc. 947,427.02	....
Profit on sale of U. S. Liberty Loan Bonds	187,572.15	.....	Inc. 187,572.15	....
Adjustment of Discount on Divisional First Lien and General Mortgage Bonds	476,417.78	.....	Inc. 476,417.78	....
Miscellaneous Credits	52,522.12	59,108.43	Dec. 6,586.31	11.14
TOTAL CREDITS	$57,003,724.89	$49,351,082.38	Inc. $7,652,642.51	15.51
CHARGES:				
Dividend Appropriations of Surplus, Common Stock	$10,327,616.50	$9,960,778.50	Inc. $366,838.00	3.68
Surplus Appropriated for Investment in Physical Property	114,844.69	2,041,797.49	Dec. 1,926,952.78	94.38
Loss on Retired Road and Equipment	142,822.32	39,175.30	Inc. 103,647.02	264.57
Account of "Over" Maintenance in settlement with U. S. R. R. Administration	1,749,446.58	.....	Inc. 1,749,446.58	....
Premium paid in redemption of Equipment Trust No. 54	165,240.00	.....	Inc. 165,240.00	....
Miscellaneous Debits	54,872.35	33,311.46	Inc. 21,560.89	64.73
TOTAL CHARGES	$12,554,842.44	$12,075,062.73	Inc. $479,779.71	3.97
Balance, December 31st	$44,448,882.45	$37,276,019.65	Inc. $7,172,862.80	19.24

NORFOLK AND WESTERN RAILWAY COMPANY CONDENSED GENERAL BALANCE SHEET, DECEMBER 31ST, 1923.

ASSETS

				Comparison with Dec. 31st, 1922
Investments:—				
Investment in Road and Equipment:				
Road		$243,595,312.92	.....	I. $6,550,705.10
Equipment		91,184,210.31	.....	D. 594,046.80
			$334,779,523.23	
Deposits in lieu of mortgage property sold		.....	8,178.94	D. 11,473.31
Miscellaneous Physical Property		.....	3,844,891.88	I. 152,815.85
Investments in Affiliated Companies:—				
Stocks		$2,079,871.42	.....	I. 625,700.00
Bonds		286,892.00	.....	D. 36,549.25
Advances		13,559,145.61	.....	I. 63,067.25
			15,925,909.03	
Other Investments:—				
Stocks		$4,696.40	.....	.....
Bonds		13,461,360.81	.....	D. 2,491,940.34
			13,466,057.21	
Total		.....	$368,024,560.29	
Current Assets:—				
Cash		$4,152,001.28	.....	I. 1,248,425.10
Loans and Bills Receivable		258,719.20	.....	D. 22,513.08
Traffic and Car Service Balances Receivable		1,617,979.51	.....	D. 274,246.38
Net Balances Receivable from Agents and Conductors		721,062.50	.....	D. 147,235.11
Miscellaneous Accounts Receivable:				
Due from U. S. Government under Sec. 209, Trans. Act 1920.	$4,214,551.11			
Other Accounts	2,235,668.90			
		6,450,220.01	.....	D. 7,232,718.04
Material and Supplies		14,637,077.87	.....	I. 3,345,890.54
Interest and Dividends Receivable		28,336.23	.....	D. 23,212.11
Other Current Assets		35,456.48	.....	I. 894.86
Total		.....	27,900,853.08	
Deferred Assets:				
Working Fund Advances		$9,228.85	.....	I. 638.42
Norfolk and Western Railway Company and Pocahontas Coal and Coke Company Joint Purchase Money Mortgage Bonds		14,869,000.00	.....	D. 393,000.00
Securities held in trust for Relief and Pension Department		492,000.00	.....	I. 167,000.00
Other Accounts		10,911.89	.....	D. 2,088.11
Total		.....	15,381,140.74	
Unadjusted Debits:				
Rents and Insurance Premiums Paid in Advance		$37,430.45	.....	I. 2,647.11
Discount on Funded Debt		552,545.44	.....	I. 552,545.44
Other Unadjusted Debits		391,283.75	.....	D. 618,364.06
Securities Issued or Assumed—Unpledged—				
Par value of holdings at close of year	$839,100.00			
Total		.....	981,259.64	
			$412,287,813.75	

LIABILITIES

				Comparison with Dec. 31st, 1922
Capital Stock:				
Adjustment Preferred	$23,000,000.00			
Held in Treasury	7,700.00			
		$22,992,300.00		
Common	$128,996,700.00			
Held in Treasury	2,400.00			
		128,994,300.00	.....	I. $1,167,400.00
Long Term Debt:				
Mortgage Bonds	$83,301,500.00		$151,986,600.00	
Held in Treasury	679,000.00			
		82,622,500.00	.....	
Convertible Bonds		12,170,300.00	.....	D. 1,167,400.00
Equipment Obligations	$7,030,000.00			
Held in Treasury	150,000.00	6,880,000.00	.....	D. 377,500.00
			101,672,800.00	
Current Liabilities:				
Loans and Bills Payable		.....	.....	D. 2,250,000.00
Traffic and Car Service Balances Payable		$135,837.67	.....	D. 127,379.53
Audited Accounts and Wages Payable		5,236,776.97	.....	I. 9,692.21
Miscellaneous Accounts Payable		499,822.70	.....	I. 11,780.74
Interest Matured Unpaid		54,912.00	.....	D. 465,598.50
Dividends Matured Unpaid		10,374.75	.....	I. 14.25
Funded Debt Matured Unpaid		6,000.00		
Unmatured Dividends Declared		229,923.00		
Unmatured Interest Accrued		1,424,341.00	.....	I. 299,964.50
Total			7,597,988.09	
Deferred Liabilities:				
Due U. S. R. R. Administration—Material and Supplies		.....	.....	D. 1,948,404.52
Securities held in Trust for Relief and Pension Department		$492,000.00	.....	I. 167,000.00
Liability for Equipment under Equipment Trust "1922"		.....	.....	D. 7,122,052.80
Liability for Equipment under Equipment Trust "1923"		9,345,260.27	.....	I. 6,449,798.98
Other Accounts		120,175.31	.....	I. 79,563.69
Total			9,957,435.58	
Joint Liabilities:				
Norfolk and Western Railway Company and Pocahontas Coal and Coke Company Joint Purchase Money Mortgage Bonds		.....	14,869,000.00	D. 393,000.00
Unadjusted Credits:				
Tax Liability		$3,465,887.01	.....	I. 209,659.25
Insurance and Casualty Reserves		568,971.50	.....	D. 85,678.73
Accrued Depreciation—Road		9,888,501.10	.....	I. 786,436.20
Accrued Depreciation—Equipment		23,152,420.92	.....	D. 1,727,952.05
Accrued Depreciation—Miscellaneous Physical Property		365,441.71	.....	I. 117,450.72
Other Unadjusted Credits		939,253.42	.....	D. 58,558.82
Total			38,380,475.66	
Corporate Surplus:				
Additions to Property through Income and Surplus:—				I. 114,844.69
Road	$20,069,605.70			
Equipment	23,305,026.27			
		$43,374,631.97	.....	.....
Profit and Loss Balance		44,448,882.45	.....	I. 7,172,862.80
Total		.....	87,823,514.42	
			412,287,813.75	

FUNDED DEBT.

The aggregate Funded Debt actually outstanding was as follows:

	Dec. 31st, 1923	Dec. 31st, 1922	Decrease
Mortgage Bonds	$82,622,500	$82,622,500	.....
Convertible Bonds ($441,000 not now convertible)	12,170,300	13,337,700	$1,167,400
Equipment Trust Obligations	6,880,000	7,257,500	377,500
	$101,672,800	$103,217,700	$1,544,900

ROAD AND EQUIPMENT.

The additions to cost of road and equipment during the year, as shown in detail on page 22, were $5,956,658.30.

From the commencement of operations October 1st, 1896, to December 31st, 1923, the charges to your Company's property accounts for investment in road and equipment were $202,222,397.20

There were also direct charges to Income for additions and betterments before June 30th, 1907, aggregating..... *12,856,272.67

Total additions to cost of road and equipment....$215,078,669.87

Of this total the sum of $43,374,631.97 was provided by appropriations from Surplus Income since June 30th, 1907, and *12,856,272.67 was provided by direct charges to Income.

Double tracking is in progress on the Big Sandy Line in sections aggregating 16.60 miles.

An additional track, 1.80 miles in length, has been constructed on the low-grade line between Bluestone and Ruth, W. Va., making this section a double-track low-grade line.

The temporary agreement of lease with the Virginia Holding Corporation dated October 1st, 1922, covering 1,000 steel underframe box cars, 100,000 lbs. capacity, 2,000 all-steel hopper coal cars, 140,000 lbs. capacity, 12 Mountain type passenger locomotives and 30 Mallet freight locomotives, of the approximate aggregate value of $9,250,000, was replaced under date of February 1st, 1923, by an Equipment Trust Agreement, Series of 1923, providing for the issue by the Commercial Trust Company (now Bank of North America and Trust Company), Trustee, of $8,000,000 Equipment Trust 4½ per cent. Certificates, payable in ten annual installments of $800,000 each from February 1st, 1924, to February 1st, 1933, inclusive, and guaranteed, principal and dividends, under authority of the Interstate Commerce Commission, by the Norfolk and Western Railway Company. The maturities of 1925 to 1933, inclusive, were sold in January, 1924.

New equipment received and equipment rebuilt during the year were as follows:

- 2 switching locomotives (steam) rebuilt as saddle tank locomotives.
- 12 passenger locomotives (steam).
- 30 freight locomotives (steam).
- 7 all-steel dining cars.
- 1,000 steel underframe box cars, 100,000 lbs. capacity.
- 497 all-steel hopper cars, 140,000 lbs. capacity.
- 29 steel underframe cabin cars.
- 1,393 wooden hopper cars, 115,000 lbs. capacity, rebuilt as all-steel hopper cars, 115,000 lbs. capacity.
- 557 all-steel hopper cars, 115,000 lbs. capacity, rebuilt as all-steel hopper cars, 115,000 lbs. capacity.
- 1 wrecking crane.
- 3 tool cars (built with second-hand material).
- 30 maintenance of way camp cars (built with second-hand material).
- 2 maintenance of way flat cars (built with second-hand material).
- 2 locomotive cranes.
- 1 Ford automobile truck.

Of this equipment, 2 switching locomotives (steam) rebuilt as saddle tank locomotives, 29 steel underframe cabin cars, 3 tool cars, 30 maintenance of way camp cars, 2 maintenance of way flat cars were built at your Roanoke Shops.

ADDITIONS AND BETTERMENTS TO WAY AND STRUCTURES

97.50 miles of track were laid with 130-lb. rail, making the total amount of track now laid with this weight of rail 212.43 miles.

93.25 miles of track were laid with 100-lb. rail, making the total amount of track now laid with this weight of rail 1,608.90 miles.

256,015 cubic yards of stone and 47,620 cubic yards of prepared slag were used in standard ballasting on the main line.

Storage tracks, with a capacity of 100 cars each, for assembling loads are being constructed between Mile Posts 8 and 9 on the Big Sandy Line.

An extension of 4,447 feet was made to the middle track at Elliston, Va. In connection with this work two curves were eliminated and two others reduced, thereby greatly improving the alignment.

Auville Yard is being enlarged to provide eight yard tracks, each track having a capacity of 100 cars, in order to facilitate the movement of traffic. It is expected this work will be completed by April 1st, 1924. Work is also in progress on the construction of terminal facilities at this point which are expected to be completed in June, 1924.

Engine terminal facilities were constructed jointly with the Pennsylvania Railroad at Hagerstown Junction, Maryland, in order to more adequately take care of present equipment and eliminate delays to traffic movement.

Passenger and freight stations were built or enlarged at Suffolk, Appomattox, Pembroke and St. Paul, Va., Lansing, N. C., and Adanac, W. Va.

The salvage warehouse at Roanoke, Va., has been improved and changes made for its use by American Railway Express Co. Ice crushing plants were installed in re-icing stations at Crewe, Va., and Bluefield, W. Va. Material storage buildings were erected at Davy, W. Va., and Portsmouth, Ohio. A car foreman's office was erected at Winston-Salem, N. C., and an oxyweld generating plant at Bluefield, W. Va. The yard office at Williamson, W. Va., was extended. A crude oil storage tank and building were erected at Lambert Point, Va.

Coaling stations of Norfolk type were erected at Clift Yard, Eckman, Wilcoe and Auville, W. Va.

A 200-ton track scale was erected at Lambert Point, Va., two 200-ton track scales—replacing lighter scales—were erected at Portsmouth, Ohio, and 150-ton track scales—replacing lighter scales—were erected at East Radford, Va., and Kenova, W. Va.

Water softening plants of 25,000 gallons per hour capacity were installed at Shenandoah Junction, W. Va., and Clare, Ohio, of 50,000 gallons per hour capacity at Columbus, Ohio, and of 125,000 gallons per hour capacity at Portsmouth, Ohio.

Water tanks of 50,000 gallons capacity were erected at Finney, Va., Matewan, W. Va., and at Columbus and Batavia, Ohio, and tanks of 200,000 gallons capacity were erected at Williamson, W. Va., and Clare, Ohio.

Additional units were added to the filter plant at Portsmouth, Ohio.

Electric pumps were installed at Phoebe, Shenandoah and Graham, Va.

Flood lights have been installed at all important yards, resulting in increased efficiency and considerable decrease in claims for damage and personal injury.

Mechanical rectifiers were provided on Lambert Point Branch, also between Bridge No. 5 and Gilmerton, and between Evergreen and Bedford, Va., thereby reducing the cost of current for signals.

3.93 miles of fencing were erected.

496 feet of light steel bridges were replaced with standard steel structures.

327 feet of new standard steel bridges were constructed.

Three concrete undergrade crossings and one concrete overhead crossing were constructed.

Seven highway grade crossings were eliminated during the year, three by change of county road and four by undergrade crossings.

MAINTENANCE EXPENDITURES

The expenses for Maintenance of Way and Structures were as follows:

	1923	1922	Decrease	Per Cent Decrease
Total Expenses	$12,406,593.28	$12,446,292.12	$39,698.84	.32
Average per mile of road operated	5,542.89	5,561.64	18.75	.34
Average per mile of track operated	2,859.95	2,870.00	10.05	.35

The expenses for Maintenance of Equipment were as follows:

	1923	1922		Increase or Decrease	Per Cent
Total Maintenance of Equipment Expenses	$25,137,890.28	$23,524,842.33	I.	$1,613,047.95	6.9
In which are included:					
Steam Locomotives (Freight): Repairs, retirements and depreciation	9,510,182.84	8,431,030.95	I.	1,079,151.89	12.8
Average per locomotive	10,215.90	9,384.70	I.	831.20	8.9
Average per 1,000 locomotive miles	544.34	527.41	I.	16.93	3.2
Electric locomotives (Freight): Repairs, retirements and depreciation	309,041.22	311,453.52	D.	2,412.30	.8
Average per locomotive	25,753.44	25,954.46	D.	201.03	.8
Average per 1,000 locomotive miles	774.32	752.35	I.	21.97	2.9
Steam Locomotives (Passenger): Repairs, retirements and depreciation	1,469,304.96	1,514,620.70	D.	45,315.74	3.0
Average per locomotive	11,061.54	9,405.83	I.	1,655.71	17.6
Average per 1,000 locomotive miles	282.10	301.50	D.	19.40	6.4
Freight Train Cars: Repairs, retirements and depreciation	11,028,227.60	10,697,974.82	I.	330,252.78	3.1
Average per freight car	244.91	235.46	I.	9.45	4.0
Average per 1,000 tons one mile	.99	1.03	D.	.04	4.0
Passenger Train Cars: Repairs, retirements and depreciation	928,733.57	999,617.70	D.	70,884.13	7.1
Average per passenger car	1,816.31	1,843.46	D.	27.15	1.5
Average per 1,000 passengers one mile	3.14	3.81	D.	.67	17.6
Work Equipment: Repairs, retirements and depreciation	257,549.46	203,194.94	I.	54,354.52	26.7

There were in the shops undergoing and awaiting classified repairs at the close of the year, 102 locomotives, or 9.8 per cent. (28 needing only light repairs), no electric locomotives, 16 passenger cars, or 3.2 per cent., and 953 freight and work equipment cars, or 2.3 per cent.

TRAFFIC AND OPERATING REVENUE COMPARISONS

Comparison of traffic and operating revenue figures with those of the preceding year shows the following interesting changes:

			Per cent
Number of passengers—6,243,478—increased	208,947		3.46
Average haul of passengers—47.42 miles—increased	4.04	miles	9.31
Revenue from passenger fares—$10,194,497.03—increased	$1,001,898.03		10.90
Average rate per passenger per mile—3.444 cents—decreased	0.068	cents	1.94
Revenue freight carried—42,574,883 tons—increased	5,217,805	tons	13.97
Average haul of freight—262.16 miles—decreased	16.83	miles	6.03
Revenue from freight transportation—$81,320,794.26—increased	$3,683,363.38		4.74
Average rate per ton per mile—0.729 cents—decreased	0.016	cents	2.15
Average tons of revenue freight per train mile—1,076.30—increased	26.90	tons	2.56
Shipments of Coal—29,477,415 tons—increased	1,351,219	tons	4.80
Shipments of Coke—666,096 tons—increased	288,911	tons	76.60
Shipments of Ore—793,170 tons—increased	258,467	tons	48.34
Shipments of Pig and Bloom Iron—334,164 tons—increased	133,120	tons	66.21
Shipments of Lumber—1,588,348 tons—increased	541,594	tons	51.74

ELECTRIFICATION.

The extension of the electrification system from West Vivian to Farm, W. Va., and on Tug Fork Branch to Wilcoe, W. Va., was completed during the early part of the year and the expected economical advantages are now being secured.

A further extension of the electrified district from Farm to Iaeger, W. Va., is now in progress and it is expected will be completed and in operation during the summer of 1924.

AUTOMATIC TRAIN CONTROL.

On June 13th, 1922, the Interstate Commerce Commission issued an order requiring certain carriers, including your Company, to install an automatic train control device on one full passenger locomotive division of road. Per-

mission was granted your Company to make this installation on the Shenandoah Division between Shenandoah, Va., and Hagerstown, Md., covering approximately 107 miles of road. Contracts have been made for the signal system to be installed and also for the necessary engine equipment, all of which is expected to be delivered during 1924, the estimated cost being $1,112,000. The type of train control to be used is the continuous induction type of the Union Switch & Signal Co.

On January 14th, 1924, the Commission issued a second order, requiring additional installations, including a district on your Company's main line, which it is estimated would cost about $1,200,000. Your Company has joined with other carriers in a petition to the Commission for an extension of time under the first order and that the later order be annulled, on the ground that no device has yet been installed that can properly be said to be more than an experiment and that the installation will involve an expenditure of many million dollars and a considerable increase in operating costs. If this order is not withdrawn an effort will be made to have the designated district changed from the main line to the Shenandoah Division to connect with the work now being done under the first order.

LAMBERT POINT COAL PIERS

For the purpose of more economically handling coal over Piers Nos. 2 and 3, at Lambert Point, Va., an electrically operated 120-ton car dumper, with loading hopper of 4,800 cubic feet capacity, has been erected, and Coal Piers Nos. 2 and 3 have been electrified.

This new car dumper is designed for handling all regular types of open-top railway cars at a rate of not less than thirty cars per hour. The coal is dumped into the loading hopper, where it is distributed into electrically operated transfer cars of different capacities, ranging from 60 tons to 120 tons. These electrically operated coal transfer cars transport the coal under their own power to the tops of Coal Piers Nos. 2 and 3, also to the top of Coal Pier No. 4, using the car elevator, where they discharge into vessels through coal chutes.

To eliminate the use of steam engines for hoisting coal at Pier No. 3, and the use of a steam locomotive for placing coal cars on Pier No. 2, these piers are now connected with the dumpers by trestles which are equipped with trolley and third-rail current transmission for electric operation.

In order to provide facilities for delivering coal to Piers Nos. 2 and 3, six new, especially designed, electrically operated coal transfer cars of 3,100 cubic feet capacity each have been purchased; and additional electric motors have been installed on four 60-ton pier cars, in order to increase their power sufficiently to overcome the grade leading to Coal Pier No. 3.

TIMBER PRESERVING PLANT

The increase of material treated at this plant during the second year of operation and its successful operation are very gratifying. The timber treated during the year was as follows:

758,524 cross-ties,
2,375,387 feet B.M. switch and bridge ties,
3,312,913 feet B.M. pine lumber,
18,395 lineal feet pine piling,
5,897,500 tie plugs,
455 lineal feet poles,
953 cross-arms.

SETTLEMENT WITH UNITED STATES GOVERNMENT

On August 16th, 1923, by authority of your Board of Directors a contract was executed between this Company and the Director General of Railroads covering full and final settlement of all claims and demands of your Company and its subsidiaries growing out of and connected with the period of Federal control. Under this settlement the Director General of Railroads paid to your Company the sum of $7,285,000. The adjustments made necessary by this settlement are reflected in the Balance Sheet.

OPERATING RESULTS

The year set a new high record of Operating Revenues, viz., $95,591,682.35, an increase of $5,238,795.16 or 5.80 per cent over 1922, and this in face of the fact that during the first half of 1922 freight rates were approximately 11 per cent higher than in 1923. Operating Expenses, however, increased $4,546,067.39 or 6.68 per cent, so that Net Revenue from Operations for the year was only slightly greater than the corresponding figures of the previous year. Payrolls increased 7.5 per cent, cost of fuel increased 28.8 per cent and cost of other materials decreased 3 per cent.

The year in respect both to earnings and expenses was a much more normal one than 1922, as the following comparison by quarters will indicate:

	Jan.-March	Apr.-June	July-Sept.	Oct.-Dec.
OPERATING REVENUES:—				
Freight	$18,118,332.37	$20,167,149.16	$21,824,997.99	$21,211,388.62
Passenger, Mail and Express	2,768,721.13	3,222,637.80	3,441,606.28	3,095,691.27
Other	386,731.67	396,789.61	435,391.11	522,245.34
Totals	$21,273,785.17	$23,786,576.57	$25,701,995.38	$24,829,325.23
1922 figures in italics	*19,855,007.53*	*26,171,647.41*	*23,337,435.53*	*20,988,796.72*
OPERATING EXPENSES:—				
Maintenance of Way and Structures	$2,755,794.83	$3,127,060.01	$3,576,965.35	$2,949,155.30
Maintenance of Equipment	5,934,936.73	5,991,981.23	6,725,167.22	6,488,524.31
Transportation	7,943,726.69	7,869,355.18	8,149,844.44	8,034,687.52
Other	751,764.61	767,069.74	750,161.21	782,676.54
Totals	$17,386,222.86	$17,755,466.16	$19,202,138.22	$18,255,043.67
1922 figures in italics	*14,704,102.65*	*16,167,770.38*	*17,102,879.30*	*20,078,051.19*
Ratio of Expenses to Total Operating Revenues.	81.73%	74.64%	74.71%	73.52%
1922 figures in italics	*74.06%*	*61.78%*	*73.29%*	*95.66%*
Net Revenue from Operations	$3,887,562.31	$6,031,110.41	$6,499,857.16	$6,574,281.56
1922 figures in italics	*5,150,904.88*	*10,003,877.03*	*6,234,556.23*	*910,745.53*

TAXES

The charge to revenues for taxes was $6,225,000, the largest amount in the history of the Company, and an increase of $225,000 or 3.75 per cent over the year 1922, this increase being due to greater net earnings in 1923, and a higher rate of levy applied to the assessment of your Company's property in Virginia and West Virginia. The charges for taxes and the yearly percentages of increase or decrease for the last eight years were as follows:

Year Ending	Charges For Taxes	Comparison with Preceding Year	
December 31st, 1916	$2,480,000	Increase	22.59 per cent
" " 1917	5,095,000	Increase	105.44 "
" " 1918	4,620,000	Decrease	9.32 "
" " 1919	4,976,000	Increase	7.71 "
" " 1920	4,400,000	Decrease	11.58 "
" " 1921	4,730,000	Increase	7.50 "
" " 1922	6,000,000	Increase	26.85 "
" " 1923	6,225,000	Increase	3.75 "

The charge for taxes for the year 1923 was 151.01 per cent greater than for the year 1916.

The percentage of Net Revenue from Operations consumed by taxes for the year ending December 31st, 1923, was 27.22 per cent. This compares with a percentage of taxes to Net Revenue from Operations of 9.56 per cent in 1916.

RETURN UPON INVESTMENT

The following table shows for the last thirteen and one-half years the percentage ratio of Net Railway Operating Income to Railway Property Investment, including in Railway Property Investment expenditures for Additions and Betterments charged directly to Income or to reserves created from Income before July 1st, 1907, from which date the accounting classifications of the Interstate Commerce Commission have required all similar expenditures to be charged to Property Investment accounts, and also including the value of Material and Supplies on hand at the close of each year. The Net Railway Operating Income upon which the percentages are based follows the definition in the Transportation Act and is made up of Net Revenue from Operations deducting Tax Accruals and Uncollectible Revenues and adding Equipment and Joint Facility Rents.

For 1918 and subsequent years the table includes operating results of or for account of the Federal Government.

FOR	Railway Property Investment including Material and Supplies*	Net Railway Operating Income	Return on Investment
Fiscal years ending:			%
June 30th, 1911	$235,850,555.46	$12,120,548.83	5.14
June 30th, 1912	242,656,045.04	13,668,435.17	5.63
June 30th, 1913	255,414,078.05	14,855,906.73	5.82
June 30th, 1914	269,100,666.12	14,020,688.16	5.21
June 30th, 1915	275,329,352.26	14,359,734.84	5.22
June 30th, 1916	283,394,811.71	24,045,710.03	8.48
Calendar years ending:			
December 31st, 1916	287,406,380.10	24,866,782.43	8.65
December 31st, 1917	303,327,414.78	21,928,005.74	7.23
December 31st, 1918	317,950,562.76	16,450,087.35	5.17
December 31st, 1919	326,047,116.71	8,176,537.94	2.51
December 31st, 1920	342,544,618.29	3,612,843.10	1.05
December 31st, 1921	348,091,045.54	14,870,020.43	4.27
December 31st, 1922	357,551,199.45	18,624,467.57	5.21
December 31st, 1923	367,088,393.95	19,877,676.85	5.41

*Includes Investment in Company Mines, which produce fuel coal for use of Norfolk and Western Railway Company only, but does not include any Working Capital.

RELIEF AND PENSION DEPARTMENT

At the end of the year the Relief Fund had 19,687 members, equivalent to 71.28 per cent of the number of employees, an increase in the year in number of members of 5,556 and in percentage of members to employees of 20.13 per cent. The Fund paid during the year in accident death benefits $25,750.00, in sickness death benefits $128,809.50, in accident disability benefits $76,608.25 and in sickness disability benefits $241,676.20, a total of $472,843.95.

In the same period the Company paid for maintenance expenditures of the Relief and Pension Department the sum of $116,539.49 and the members of the Fund contributed the sum of $630,644.79. Interest on monthly balances in the hands of the Treasurer of the Company amounted to $2,704.28 and interest from investments $14,621.09. A full financial statement of the Relief Fund, which has been audited by a Committee from the contributing members, will be found on page 27 of this Report.

From the date of organization of the Relief Fund, July 1st, 1917, a total amount of $2,559,043.93 has been paid out for death and disability benefits and in the same period the Company has paid $616,057.97 for maintenance expenditures of the Department.

On December 31st the number of employees on the Pension Roll was 487. The total amount paid in pensions for the year ending December 31st was $211,262.52.

NORFOLK AND WESTERN MAGAZINE

On June 1st, 1923, the first number of the Norfolk and Western Magazine was issued, under the editorial charge of Holcombe Parkes. The magazine was established to serve as a medium for the exchange of helpful and interesting information about the railroad, its policies and activities, its officers and employees and their families, to encourage safety, efficiency and economy and a realization of duties owed to the public, to promote on the part of the officers and employees that pride in their work and loyalty to the Company which have played such an important part in their past successes, and to increase co-operation between officers and employees through a more comprehensive understanding of each other's problems. The magazine is published monthly.

POCAHONTAS COAL AND COKE COMPANY

Under the sinking fund provision of the Pocahontas Coal and Coke Company Purchase Money First Mortgage, dated December 2nd, 1901, the sum of $314,687.23 accrued from royalties on coal mined during the calendar year 1923. From the beginning of the operation of the sinking fund in 1906 to December 31st, 1923, the accruals from royalties have aggregated $4,662,535.37 and those from sales of lands $173,550.90, a total of $4,836,086.27 applicable to the purchase and retirement of mortgage bonds. Through this fund $5,131,000 of bonds had been purchased and canceled to Decem-

ber 31st, 1923. Additional bonds amounting to $358,000 were purchased and canceled in February, 1924.

A further payment of $105,000 has been made on account of indebtedness incurred in previous years to meet fixed charges.

The consolidation of the Company's properties through purchases of interior tracts and exchanges of lands with other companies, and the work of completing titles, surveying, monumenting and mapping, continue.

BIG SANDY AND CUMBERLAND RAILROAD COMPANY

Under date of October 12th, 1923, your Company acquired by purchase the entire capital stock, 1,000 shares, of the Big Sandy and Cumberland Railroad Company, a Virginia corporation, owning and operating a lumber road 33.08 miles in length from Devon, West Va., on your Company's line, to Grundy, Va., and at the same time acquired the entire capital stock, 105 shares, of the Knox Creek Railroad Company, owning right of way in Kentucky, which is leased to the Big Sandy and Cumberland Railroad Company. This purchase gives your Company access to considerable areas of lumber and coal in Buchanan County, Va., and the present line of the Big Sandy and Cumberland will be revised and extended with a view to future developments.

INDUSTRIES

Among the new local industries are the following:

14 manufactories of mineral, metal and other products,
26 manufactories of lumber products,
17 manufactories of farm implements and farm products,
7 coal mines.

At the close of the year there were 224 companies organized for producing coal and coke on your Company's lines, with a total of 325 separate mines, of which 222 were in actual operation.

Of the 17 iron furnaces with a total daily capacity of 3,555 tons of pig, 4 having a total daily capacity of 1,415 tons were in blast.

OBITUARY

In the death on March 9th, 1924, of Captain John P. Green, your Company lost the services of its oldest Director in years and length of service. He was in his eighty-fifth year, had been a member of the Board since June 13th, 1900, and at the time of his death was Chairman of the Finance Committee. He had served continuously with the Pennsylvania Railroad Company in various official capacities from 1865 until his retirement in 1909, at which time he was then its First Vice-President. His counsel as a member of the Norfolk and Western Railway Company's Board of Directors upon financial and other matters was always valuable and helpful. He retained to the end his interest in the Company's affairs with a clear grasp of details. It is a striking circumstance that he was at his desk on the day preceding his death and that his last official act was the approval of the advance proof of this report.

CHANGES IN ORGANIZATION

On December 31st, 1923, pursuant to the Company's pension regulations, Joseph W. Coxe, Comptroller, was retired after forty-four years of faithful and effective service.

W. H. Wilson, formerly Assistant Comptroller, was appointed Comptroller and W. P. Wiltsee, formerly Acting Chief Engineer, was appointed Chief Engineer, these changes both being effective January 1st, 1924.

By order of the Board of Directors,

N. D. MAHER,
President.

[ADVERTISEMENT]

(*Continued from page* 813)

that stockholders of record at the close of business March 15 transfer all warrants to which they may be entitled. The Exchange is expected to rule that the railroad stock be not quoted ex-rights until all warrants are out.

LOUISIANA RAILWAY & NAVIGATION COMPANY OF TEXAS.—*Security Issues.*—This company, recently organized to take over a line formerly operated by the Missouri, Kansas & Texas, has applied to the Interstate Commerce Commission for authority to issue $200,000 of stock and $2,963,000 of bonds to be used in payment for the property.

MISSOURI PACIFIC.—*Six Months' Guaranty.*—The Interstate Commerce Commission has issued a final certificate stating the amount of this company's guaranty for the six months' period following the termination of federal control at $13,243,448 of which $660,448 was to be paid on the final certificate.

NEW ORLEANS, TEXAS & MEXICO.—*Bond Issue.*—This company has applied to the Interstate Commerce Commission for authority to issue $25,635,500 of first mortgage 5 per cent gold bonds, dated April 1, 1924, to April 1, 1954. It is proposed to sell $11,051,500 of the bonds at not less than 87½, to pledge $1,084,000 to secure an equipment loan, and to exchange $13,500,000 for a like amount of income bonds. The bonds are to be redeemable at 105 and interest on any interest date before 1944, the premium to be increased by ½ per cent for each year thereafter.

NEW YORK, CHICAGO & ST. LOUIS.—*Preferred Stock Offered.*—Hayden, Stone & Co. are offering a block of 6 per cent cumulative preferred stock, series A, to yield more than 7 per cent.

NORFOLK & WESTERN.—*Equipment Trust Certificates.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $12,000,000 of equipment trust certificates to be sold at 96.733.

NORFOLK & WESTERN.—*Annual Report.*—See excerpts from annual report for the year ended December 31, 1923, on adjacent pages.

Committee to Consider Lease.—See Pennsylvania, item below.

PENNSYLVANIA.—*Proposed Lease of N. & W.*—President Samuel Rea, on March 19, announced that the following directors had been appointed to consider the proposed lease of the Norfolk & Western: E. B. Morris, C. E. Ingersoll, C. B. Newbold, A. W. Thompson and Jay Cooke. The members of this committee will confer with the committee appointed by N. D. Maher, president of the Norfolk & Western, consisting of D. W. Flickwir, F. S. Royster, E. H. Alden and S. P. Bush.

Annual Meeting.—The annual meeting of the stockholders of the Pennsylvania will be held on April 8 in Philadelphia.

SOUTHERN RAILWAY.—*Initial Common Dividend.*—The directors have declared an initial quarterly dividend of 1¼ per cent on the outstanding $120,000,000 common stock, payable May 1 to holders of record April 10.

The regular semi-annual dividend of 2½ per cent on the $60,000,000 5 per cent non-cumulative preferred stock has also been declared, payable April 21 to holders of record March 29. It is the intention of the board hereafter to give consideration to the payment of dividends on the preferred stocks quarterly instead of semi-annually.

PITTSBURGH & WEST VIRGINIA.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a balance after 6 per cent preferred dividends of $1,331,632 as compared with $733,005 in 1922. Selected items from the income statement follow:

	1923	1922
*Railway operating revenues	$3,844,587	$2,835,601
*Railway operating expenses	3,020,328	2,236,824
Net revenue from railway operations	824,259	598,777
*Railway tax accruals	481,112	365,285
Railway operating income	343,101	233,474
*Hire of freight cars—Net credit	991,610	569,577
Net railway operating income	1,322,584	797,704
Dividend income	720,000	560,000
Total non-operating income	806,834	640,883
Gross income	2,129,418	1,438,587
Total deductions from gross income	253,545	161,340
Net income	1,875,874	1,277,247
Dividend appropriations of income	544,242	544,242
Income balance	1,331,632	733,005

*Includes West Side Belt Railroad operation.

VALLEY.—*Bond Issues.*—This company has been authorized by the Interstate Commerce Commission to issue $443,000 of first and refunding mortgage 5 per cent gold bonds to be delivered to the Delaware, Lackawanna & Western, lessee, in refundment of certain obligations.

WESTERN PACIFIC.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of $3,105,000 of 5½ per cent equipment trust certificates to be taken at par by the American Car & Foundry Company.

Trend of Railway Stock and Bond Prices

	March 19	Last Week	Last Year
Average price of 20 representative railway stocks	62.55	62.36	69.06
Average price of 20 representative railway bonds	84.36	83.83	82.84

Dividends Declared

Philadelphia & Western.—Preferred, 1¼ per cent, quarterly, payable April 15 to holders of record March 31.

Southern Railway.—Common, 1¼ per cent, quarterly, payable May 1 to holders of record April 10; preferred, 2½ per cent, semi-annually; payable April 21 to holders of record March 29.

Tonopah & Goldfield.—Common, 3 per cent; preferred, 7 per cent; both payable March 15 to holders of record March 14.

West Jersey & Seashore.—Common, 2 per cent, semi-annually, payable April 1 to holders of record March 15.

Western Pacific.—Preferred, $1.50, quarterly, payable April 1.

Railway Officers

Executive

S. D. Warfield, president of the Seaboard Air Line, with headquarters at Baltimore, Md., has been elected also president of the Macon, Dublin & Savannah, a subsidiary of the Seaboard Air Line, succeeding James A. Blair, Jr., resigned.

W. M. Neal, general superintendent of the Algoma district of the Canadian Pacific, with headquarters at North Bay, Ont., has been promoted to assistant to the vice-president, with headquarters at Montreal, Que., succeeding James Manson, whose death on March 7 was reported in the *Railway Age* of March 15.

E. M. Durham, Jr., whose appointment as assistant to the president of the Missouri Pacific, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of March 8, was born on October 23, 1873, at Memphis, Tenn. He graduated from Lehigh University in 1896 and entered the service of the United States War Department, making hydrographic surveys on the Ouachita river. Mr. Durham entered railway service as a transit man on the Chicago & North Western in 1899. In 1900 he was appointed assistant engineer on the Southern on which road he was successively promoted to resident engineer, principal assistant engineer, assistant chief engineer and chief engineer. He was appointed valuation engineer of the Atlanta, Birmingham & Atlantic in 1914 and a year later, returned to the Southern as executive general agent. Mr. Durham was appointed manager of the department of way and structures of the United States Railroad Administration in 1920 and later was appointed director of the Division of Liquidation Claims. He continued in this position until his recent appointment as assistant to the president of the Missouri Pacific.

Operating

F. R. Lloyd, whose promotion to superintendent of the Peninsula division of the Chicago & North Western, with headquarters at Escanaba, Mich., was reported in the *Railway Age* of March 8, was born on June 4, 1870, at Carnegie, Pa. He entered railway service in March, 1888, as a brakeman on the Pennsylvania and subsequently was employed in a similar capacity on the Chicago, Milwaukee & St. Paul. He entered the service of the Chicago & North Western in July, 1895, as a switchman and in 1904, was promoted to yardmaster at Chicago. Mr. Lloyd was promoted to trainmaster of the Galena division in 1907, and was later transferred successively to the Southern Illinois, and to the Chicago Freight Terminal divisions. In August, 1920, he was promoted to assistant superintendent of the Iowa division, with headquarters at Clinton, Iowa, and he held this position until February, 1922, when he was transferred to the Galena division. Mr. Lloyd continued in this capacity until his recent promotion to superintendent of the Peninsula division.

F. R. Lloyd

N. S. Dresher, train dispatcher of the Sunbury division of the Pennsylvania, with headquarters at Sunbury, has been promoted to assistant trainmaster with the same headquarters.

D. D. Smith has been appointed superintendent of the Tennessee, Kentucky & Northern with headquarters at Livingston, Tenn., succeeding E. B. Draper, resigned. **L. P. Jernigan** has been appointed general agent.

H. J. Humphrey, assistant general superintendent of the Canadian Pacific, with headquarters at Toronto, Ont., has been promoted to general superintendent of the Algoma district, with headquarters at North Bay, Ont., succeeding W. M. Neal, promoted.

W. K. Etter, whose promotion to general manager of the Atchison, Topeka & Santa Fe, coast lines, was reported in the *Railway Age* of February 23, was born on January 16, 1874, at Shippensburg, Pa. He entered railway service in June, 1891, as a rodman on the Atchison, Topeka & Santa Fe and was subsequently appointed stenographer, timekeeper and clerk. In May, 1893, he was transferred to the office of the assistant superintendent at Fort Madison, Ia. He was promoted to chief clerk to the superintendent at Las Vegas, N. Mex., in June, 1894, and he held this position until October, 1901, when he was transferred to the office of the general superintendent at La Junta, Colo. Mr. Etter was promoted to trainmaster of the Eastern division in July, 1905, and in January, 1906, he was promoted to superintendent of the Rio Grande division. In October, 1907, he was transferred to the Oklahoma division and he continued in this position until September, 1916, when he was promoted to general superintendent, with headquarters at Newton, Kans. Mr. Etter was promoted to assistant general manager, with headquarters at Topeka, Kans., in November, 1918, and in April, 1921, he was promoted to assistant to the vice-president in charge of operation, with headquarters at Chicago. In April, 1922, he was appointed acting general manager at Topeka, returning to his duties as assistant to the vice-president in September of that year. Mr. Etter was appointed acting general manager of the Coast Lines in February, 1923, and he held that position until his recent promotion to general manager.

W. K. Etter

Financial, Legal and Accounting

S. A. McTaggart, auditor of agencies of the Maine Central, with headquarters at Portland, Me., has been promoted to assistant comptroller, with the same headquarters, succeeding F. A. Walsh, resigned. **H. T. Leighton** has been appointed auditor of agencies, with headquarters at Portland, succeeding Mr. McTaggart.

Traffic

J. G. Weaver, district freight agent of the St. Louis-San Francisco, with headquarters at Jacksonville, Fla., has been transferred to Ft. Smith, Ark.

D. W. Anderson has been appointed commercial agent of the Seaboard Air Line, with headquarters at Macon, Ga., succeeding G. H. Whitaker, resigned to accept service with another company.

A. D. Pendleton, division freight agent of the Pennsylvania, with headquarters at Terre Haute, Ind., has been transferred to Indianapolis, Ind., succeeding **H. C. Shepard,** who has retired under pension regulations. **J. B. McCorkle,** chief clerk to the traffic manager of the Central region, with headquarters at Pittsburgh, Pa., has been promoted to division freight agent at Terre Haute, succeeding Mr. Pendleton.

George S. Harlan, whose promotion to general freight agent of the Baltimore & Ohio, with headquarters at Philadelphia, Pa., was announced in the *Railway Age* of February 23, page 484, was born on September 19, 1875, at Baltimore, Md., and was educated in the public and private schools of that city. He entered railway service on June 14, 1890, with the Baltimore & Ohio as a relief clerk in the general office and in November, 1898, he was appointed a clerk in the receiver's office. In June, 1900, he was appointed a clerk in the office of the first vice-president and in November, 1904, he was promoted to secretary to the vice-president at Baltimore. In July, 1916, Mr. Harlan was promoted to chief clerk to the vice-president and a year later was promoted to division freight agent at Baltimore, serving in that capacity until July 1, 1921, when he was again promoted to assistant general freight agent, with the same headquarters, the position he was holding at the time of his recent promotion to general freight agent.

C. W. Price, whose promotion to assistant general passenger agent of the Union Pacific, with headquarters at Salt Lake City, Utah, was reported in the *Railway Age* of February 16, was born on November 19, 1887, at Salt Lake City. He entered railway service in January, 1903, as a messenger in the telegraph department of the Oregon Short Line at Salt Lake City. In August of that year he was appointed office boy in the general passenger department and he was later promoted to file clerk. He was appointed ticket stock clerk in July, 1908, and in July, 1911, was promoted to counter clerk. Mr. Price was promoted to chief clerk in the general passenger department in December, 1917, and held this position until his recent promotion to assistant general passenger agent. His entire railroad service has been with the Oregon Short Line and the Union Pacific.

C. W. Price

J. A. Behrle, whose promotion to freight traffic manager of the Chicago & Alton, with headquarters at Chicago, was reported in the *Railway Age* of February 16, was born on September 1, 1887, at Chicago. He entered railway service on August 6, 1903, as a clerk in the general freight department of the Chicago & Alton at Chicago, and later was promoted successively to rate clerk and tariff clerk. He was promoted to chief clerk to the assistant general freight agent of the Toledo, St. Louis & Western, the Chicago & Alton, the Minneapolis & St. Louis and the Iowa Central at Chicago on April 15, 1910. Mr. Behrle was promoted to chief of the tariff bureau of the Chicago & Alton on September 1, 1912, and he held this position until December 1, 1920, when he was promoted to assistant general freight agent. He was promoted to general freight agent, with headquarters at Chicago, on November 8, 1922, and he continued in this capacity until his recent promotion to freight traffic manager, with the same headquarters.

J. A. Behrle

Mechanical

H. K. LeSure, chief electrician in the office of the general superintendent of motive power of the Eastern Region of the Pennsylvania, has been appointed master mechanic of the New York Terminal.

E. R. Larson, general foreman, motive power department, of the Delaware, Lackawanna & Western with headquarters at Kingsland, N. J., has been appointed shop superintendent of the Bellmead shops of the Missouri-Kansas-Texas, with headquarters at Waco, Tex.

Engineering, Maintenance of Way and Signaling

L. G. Curtis, assistant chief engineer of the Baltimore & Ohio Chicago Terminal and chief engineer of the adjustment division of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been appointed chief engineer of the Baltimore & Ohio Chicago Terminal, with headquarters at Chicago.

H. C. Murphy, assistant district engineer maintenance of way of the Chicago, Burlington & Quincy, with headquarters at Alliance, Neb., has been promoted to district engineer of the Illinois district, with headquarters at Galesburg, Ill., succeeding E. F. Kultchar, resigned to accept service with another company, and will be succeeded by **T. P. O'Neill.**

Special

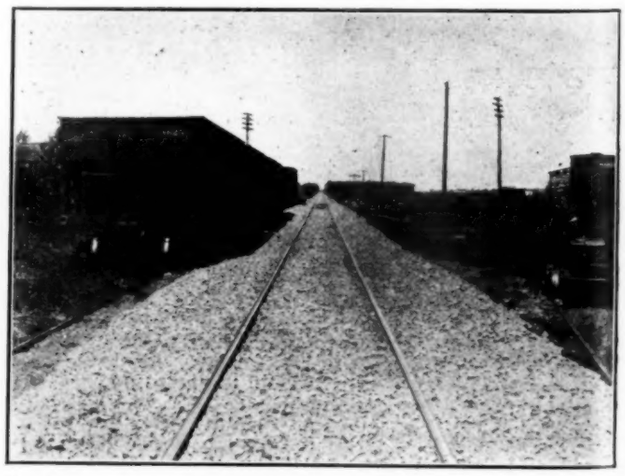
W. H. Kilby has been appointed chief of forest protection of the Canadian National, with headquarters at Montreal, Que.

Obituary

S. H. Charles, district manager, Car Service Division, American Railway Association, at Birmingham, Alabama, died on March 17.

Charles J. Joseph, tax agent of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died on March 12, after a short illness of pneumonia.

W. W. Miller, general freight agent of the Missouri-Kansas-Texas, with headquarters at St. Louis, Mo., died in that city on March 15. Mr. Miller was born on June 17, 1875, at Cairo, Ill. He entered the service of the Missouri-Kansas-Texas in March, 1893, as a clerk in the general freight office and was subsequently promoted to commercial agent and general livestock agent. In November, 1900, he was promoted to assistant general freight agent, with headquarters at Chicago and later was transferred to Kansas City, Mo. In January, 1908, Mr. Miller was transferred to St. Louis, Mo., and in January, 1914, he was promoted to general freight agent. He held this position until his death.



Keystone

Reballasting on the D. T. & I.